EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief
E. C. KREUTZBERG
Editor
A. J. HAIN
Managing Editor
E. F. ROSS
Engineering Editor
GUY HUBBARD
Machine Tool Editor
D. S. CADOT
Art Editor

ASSOCIATE EDITORS

G. H. MANLOVE — J. D. KNOX
W. G. GUDE — G. W. BIRDSALL
W. J. CAMPBELL

New York
I. H. SUCH — B. K. PRICE
L. E. BROWNE
Pittsburgh — *Chicago*
R. L. HARTFORD — J. F. POWELL
Detroit — *Washington*
A. H. ALLEN — L. M. LAMM
London
VINCENT DELPORT

ASSISTANT EDITORS

A. R. FINLEY — BERT D. LYNN
J. C. SULLIVAN — LAVERNE NOCK
New York
JOHN H. CALDWELL

BUSINESS STAFF

G. O. HAYS
Business Manager
C. H. BAILEY
Advertising Service
New York . E. W. KREUTZBERG
B. C. SNELL
Pittsburgh . . . S. H. JASPER
Chicago . . . L. C. PELOTT
Cleveland . . . R. C. JAENKE
D. C. KIEFER
J. W. ZUBER
Circulation Manager

MAIN OFFICE

Penton Building, Cleveland

BRANCH OFFICES

New York . . . 110 East 42nd St.
Chicago . 520 North Michigan Ave.
Pittsburgh . . . Koppers Building
Detroit . . . . 6560 Cass Ave.
Washington . National Press Building
Cincinnati . . . . 282 Sinton Hotel
San Francisco . . 1100 Norwood Ave.
Oakland, Calif., Tel. Glencourt 7559
London . . . . . Caxton House
Westminster, S.W. 1
Berlin . Berlin, N.W. 40, Roonstrasse 10

• • •

Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, Ohio. JOHN A. PENTON, Chairman of Board; E. L. SHANER, President and Treasurer; J. R. DAWLEY and G. O. HAYS, Vice Presidents; F. G. STEINEBACH, Secretary.
Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.
Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.
Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.
Copyright 1939 by the Penton Publishing Co.

STEEL

ESTABLISHED 1882

Contents

Volume 105—No. 11 **September 11, 1939**

READER COMMENTS 9
AS THE EDITOR VIEWS THE NEWS 13
NEWS
War Brings Sellers' Market to Steel, Metals Industries 15
Machine Tool Builders Swamped by Orders; Show Postponed 17
Financial News of Steel Industry 18
Meetings 18
New Mill for Cement-Lined Pipe 18
High-Tensile, Low-Alloy Steel in Welded "Snow Cruiser" 19
Steel Presentation Before TNEC Seen Delayed Until Year End 20
August Ingots in 19 Per Cent Rise 21
Steelworks Operations for Week 21
Men of Industry 22
Obituaries 23
Nation's Air Progress Depicted in Exhibit at New York Fair 27
WINDOWS OF WASHINGTON 24
MIRRORS OF MOTORDOM 29
EDITORIAL—Steel Production as a Barometer 32
THE BUSINESS TREND
Index of Industrial Activity Records Moderate Gain 33
Charts and Statistics 34-35
TECHNICAL
For Machine Tool Progress Take a Look at Milling 36
Stainless Steel "Lumber" Enters the Construction Field 38
Clean Steel Made in Open Hearth 45
PROGRESS IN STEELMAKING
Combustion Control 42
MATERIALS HANDLING
Conveyor Mountings 46
JOINING AND WELDING
Trailer Frame 53
METAL FINISHING
Drying by Radiant Heat 56
INDUSTRIAL EQUIPMENT 60
HELPFUL LITERATURE 61
MARKET REPORTS AND PRICES 67
The Market Week 68
BEHIND THE SCENES 78
CONSTRUCTION AND ENTERPRISE 86
INDEX TO ADVERTISERS 92

PRODUCTION • PROCESSING • DISTRIBUTION • USE

DO YOU *Have* A PROBLEM?

View of Technical Session at Association Convention.

Of course! All steel plant engineers and operators have problems. If there were no steel mill problems there would be no Association of Iron and Steel Engineers, for it was to meet these problems that the Association was founded —and it is the successful solution of these problems that has brought about the healthy growth of the Association.

The Annual Convention of the Association with its Iron and Steel Exposition, its inspection trips, and its authoritative technical sessions, affords the answer to many steel plant problems through the presentation of the latest advancements in plant equipment and methods.

Make your plans now to attend the

35th Annual Convention

and

IRON AND STEEL EXPOSITION

of the

Association of Iron & Steel Engineers

WM. PENN HOTEL, PITTSBURGH

Sept. 26 - 27 - 28 - 29, 1939

For further details write:

Association of Iron & Steel Engineers

1010 Empire Building Pittsburgh, Penn.

As the Editor Views the News

■ LAST week's 2-point dip in steel ingot production (p. 21) to 62 per cent, the result of the Monday holiday, will be short-lived. Domestic steel buyers have responded to the outbreak of war with a rush of orders (p. 67)) that quickly changed steel from a buyers' to a sellers' market. Sharp advances in steelmaking scheduled for a number of leading districts this week will raise the national average to a new high for the year to date. Foreign inquiries for steel also have spurted markedly, principally from neutral countries whose former sources of supply have been cut off by hostilities, but actual business so far has been light. Domestic steel prices are strong, with some advances in prospect. Export quotations have stiffened widely. Scrap prices have risen to the highest level in nearly two years.

• • •

Machinery Sales Spurt

Machine tool builders also have been engulfed by a flood of business that is traceable partly to the European conflict. Pressed for time and having few machines available for display, members of the National Machine Tool Builders association have taken the unusual action (p. 17) of voting to cancel the exposition originally scheduled to be held at Cleveland, Oct. 4-13. Commerce department officials believe (p. 24) exports of iron and steel and machinery from the United States to South America will be stimulated by the war. . . . Department of justice officials (p. 24) may draft new legislation to prevent runaway commodity prices and profiteering. . . . WPA has spent $200,000,000 for iron and steel products (p. 26), nearly one-fifth of total purchases.

• • •

TNEC To Hear Steel

Steel officials may not present their story before the temporary national economic committee (p. 20), which is investigating monopolistic tendencies in industry, before the end of the year. Preliminary hearings will start when the committee has completed its study of the oil industry about Oct. 15. . . . United States railroads (p. 26) are said to be able to handle at least 25 per cent more freight than they are now carrying and can accommodate a 45 per cent increase by repairing damaged equipment. . . . A new "snow cruiser" for use on an expedition to regions about the South Pole (p. 19) weighs 75,000 pounds, has a 5000-mile cruising radius. Frame of the machine is high-tensile, low-alloy steel. . . . A new mill (p. 18) is employed in the production of cement-lined steel pipe, used in transmission of corrosive fluids.

• • •

Milling Advances

Milling machine and cutter development is highlighted this week by STEEL'S machine tool editor, Guy Hubbard, "Climb cutting" especially (p. 37) puts severe demands on such units. High power features new tools. Stainless steel "lumber" (p. 38) is a new construction material with important possibilities in many fields. Featuring extreme ease of fabrication and moderate cost, it is suitable for many indoor or outdoor uses. Drying by radiant heat (p. 56) dries finishes from inside outward. New method is flexible, has high overall efficiency of 57 per cent. Huge steel plate flywheel is flame cut (p. 54) from 87,090-pound plate. Process of mixing molten metal with slags (p. 45) has permitted progress in manufacture of clean fine-grain steel in France and Poland.

• • •

Controls Combustion

New method of combustion control (p. 42) permits automatic firing and air-ratio control of either or both of two fuels. System prevents losses from the operation of coke plants to supply gas for finishing operations and permits instant changeover from gas to oil or tar. Protection of conveyor belts against excessive impact at loading points is provided by new type of conveyor mounting (p. 46). Spot welding galvanized iron sheet without leaving blemishes is difficult but a new method (p. 54) employing a copper strip does this job perfectly. Unusual fabricating system using tubes and standard sections (p. 53) has many other applications in addition to making a trailer frame with no sidesway. Welded sheet steel wheel is 25 per cent lighter and made at 15 per cent lower cost.

E C Kreutzberg

Play Safe!

Use Ryerson Certified Steels

Reduce failures . . . eliminate spoilage . . . and get better results at lower cost by using Ryerson Certified Steels—steels that represent the highest quality obtainable in each different classification.

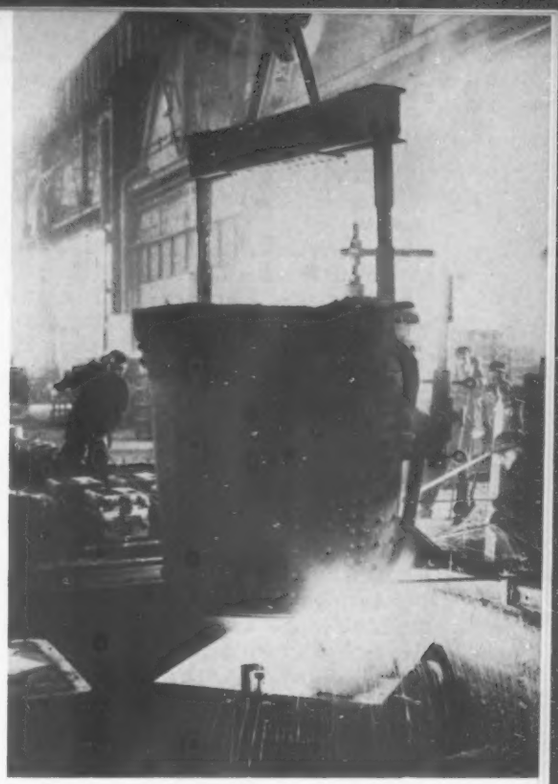
In Ryerson Certified Steels you are assured the utmost uniformity—freedom from hard spots—desirable bending and fabricating characteristics that reduce shop labor costs and help produce sound dependable jobs in less time.

On alloy steels where results are dependent on heat treatment, Ryerson selects whole heats of each analysis—tests and actually heat treats bars to determine their response—then compiles complete data to guide the heat treater in securing the best possible results. He does not have to test — to guess or take chances. He knows the characteristics of each bar of steel with which he is working.

Ryerson Certified Steels also include carbon, tool and stainless steels that meet definite high standards of uniformity and quality. They offer a safe, sure way of getting maximum value from your steel dollar.

Let us send you the Ryerson Stock List showing the full range of Certified Steels—in all shapes and sizes—carried in stock for immediate shipment. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

WAR BRINGS SELLERS' MARKET TO STEEL, METALS INDUSTRIES



■ **Government navy yards are busy turning out big guns for America's fighting vessels and coastal defense stations. Shown above is metal pouring into a gun mold**

■ WAR in Europe last week brought almost feverish activity to United States steel markets. What had been a buyers' paradise for many years suddenly became a sellers' market.

Confronted with the likelihood of advancing prices all along the line, steel buyers specified heavily on all tonnage the mills would accept at present prices for shipment in the current quarter. However, there was reluctance in many quarters to place tonnage on basis of price ruling at time of delivery, a stipulation sellers were forced to make as they became booked up for the remainder of September on many products.

Whatever weakness had existed in published prices disappeared rapidly. Consumers, noting the trend and also the delay in opening books for fourth quarter, became increasingly concerned over the possibility of higher quotations.

Meanwhile, however, eastern pig iron sellers, without making formal announcement, began covering customers for next quarter at unchanged prices. On Friday, tin plate prices were extended for the remainder of the year. These developments had only a slightly reassuring effect on most steel buyers who continued their efforts to pick up tonnage at present prices.

Policy Is "Wise Selling"

Once fourth quarter prices become generally established and buyers have an opportunity for covering, an easing in the situation, at least temporarily, is expected.

Steel mills generally are adhering to a policy of "wise selling." While belief was expressed in many quarters that steel prices will advance, the increase is expected to hold within moderate limits. Members of the Steel Export association, including the largest producers in the country, plan to keep the organization fully intact, operating as heretofore under provisions of the Webb-Pomerene act.

Foreign demand underwent a sharp spurt, mostly from neutral countries, particularly South American. Scandinavian inquiries rapidly picked up, especially for pig iron, but disappeared late in the week due to acute scarcity of bottoms for North Atlantic service, the certainty of much higher ocean and war insurance rates and definitely higher asking prices by sellers here.

Withdraw Quotations

Foreign ore importers withdrew all prices and late Thursday domestic sellers of ferromanganese withdrew all spot quotations, pending opening of books for next quarter which should come early this week and in all probability at higher levels.

Export prices on most products increased modestly, around $1.50 to $3 a ton, but on some lines increases were sharper. Pig iron advanced several dollars a ton, tin plate $6, and plates, which had been excessively weak for export, $9 a ton.

Due to the heavy prospective demand for finished steel, integrated producers are expected to conserve their own production of pig iron, thus throwing the burden of meeting foreign demand on merchant furnaces.

In few if any cases, however, did export prices exceed the domestic mark and on most products the export market continued under domestic levels. Instead of quoting even on usual f.a.s. basis, many sellers quoted for mill freight allowance, thus putting responsibilities of handling shipment entirely up to buyers. All quotations for export were in American dollars.

So confused was the situation, however, particularly because of shortage of boats, that actual buying did not run excessively large. Buying by warring countries of steel products was not expected by some trade leaders to develop in large proportions for at least another two or three months with possible exception of pig iron, although orders for machinery and certain other types of equipment may be reflected in books of American steel mills before that.

Belligerent countries are well supplied for present, and until they can get convoy systems operating on a broad scale and can get organized in other respects, there may be delay in the placing of large steel tonnages here, it was believed.

Diversion of business which has been going to the belligerents however, is expected to bring many orders for metals and finished products to American manufacturers. South America, Japan and possibly Russia will become more important buyers of American machinery and tools.

Expect Stimulating Effect

Industrialists are unanimous in their belief the hostilities abroad will have a stimulating effect in all metalworking industries for months.

Railroads are engaged in a deep analysis of equipment facilities and informed steel sellers look for a heavy increase in car demand this fall.

Shipbuilding will be accelerated. Navy department has started recon-

ditioning 116 World war destroyers.

Anticipated increase in steelmaking operations will be reflected in a sharp rise in lake ore shipments during the remainder of the season. Additional ships will be commissioned and the season probably will be extended into December, weather permitting.

On Aug. 15, 230 vessels were in commission, of which 206 were engaged in the ore trade. Shipping authorities believe at least 25 more will be placed in service by the end of September.

Aircraft production will be further spurred if the neutrality embargo is lifted.

As invoked by the President last Tuesday, the neutrality act lays an embargo on shipment of arms, munitions and implements of war to belligerents. Banned were such exports to France, Germany, Poland, United Kingdom, India, Australia and New Zealand.

Embargoed commodities cover only actual war materials: Guns, ammunition, explosives, tanks and military vehicles, poison gases and their components, war vessels, aircraft of all types and their parts.

Not restricted are raw materials, agricultural products and nonmilitary manufactured items. This leaves open to export such materials as iron and steel, scrap, oil, machine tools, machinery and foodstuffs. Increased foreign demand for these products already is evident.

Application of the embargo leaves domestic manufacturers with unfilled foreign military orders estimated at approximately $50,000,000.

Despite the fact a supplementary regulation empowers the secretary of state to request "convincing evidence that any shipment of arms is not destined for re-export to a belligerent," it is felt Canada's failure to formally declare war was a deliberate effort to remain available for trans-shipping military materials to Europe. Some authorities believe Canada's nondeclaration of war was prearranged, pointing out she was specifically excluded from the embargo proclamation.

Canada May Be "Back Door"

Likelihood is that so long as Canada does not formally declare war she will serve as a "back door" through which the democracies can obtain outlawed war items. Certain it is that Canadian branches of many American companies will enter armament production. Several Detroit automakers already are said to be studying plans for making warplanes in Canadian plants.

How long the munitions embargo will remain in effect is a matter for conjecture. The President in the past has strongly indicated his desire for revision of the neutrality act, and it is seen virtually certain he soon will call congress into special session for this purpose.

Should revision be effected it probably will take the form of a "cash and carry" system in place of the present embargo. This would make possible the sale of any materials to nations at war provided they paid cash and used their own ships.

Early months of the World war failed to affect steel and iron in the United States and the dullness that had prevailed through 1913 and early 1914 continued well into 1915. Expectation of heavy European demand did not materialize until the latter year and it was slow to develop.

By midsummer war needs were reflected in this market and great scarcity appeared during third quarter and from then to the close demand increased and prices rose steadily to new highs. In 1916 both exports and prices continued to rise and pig iron also became more active, having lagged somewhat behind steel in previous months.

Increasing needs of the allied nations for shell steel and other demands swelled the volume of steel to the ultimate capacity of producers and prices soared until the United States entered the war when our own needs became paramount and prices assumed a more practical aspect.

A conference was held at Washington July 12, 1917, participated in by a committee of the American Iron and Steel institute, the war industries board and government officials, preparatory to government regulation of prices. The President announced price fixing Sept. 24 on pig iron, steel bars, plates and shapes, applying to Jan. 1, 1918. This was followed by other announcements by the President and the institute, continuing or changing prices as circumstances dictated.

Government control was relinquished shortly after the armistice and an open market was resumed with a drop of $5 to $6 per ton on most steel products.

How World war demands were reflected in United States iron and steel exports:

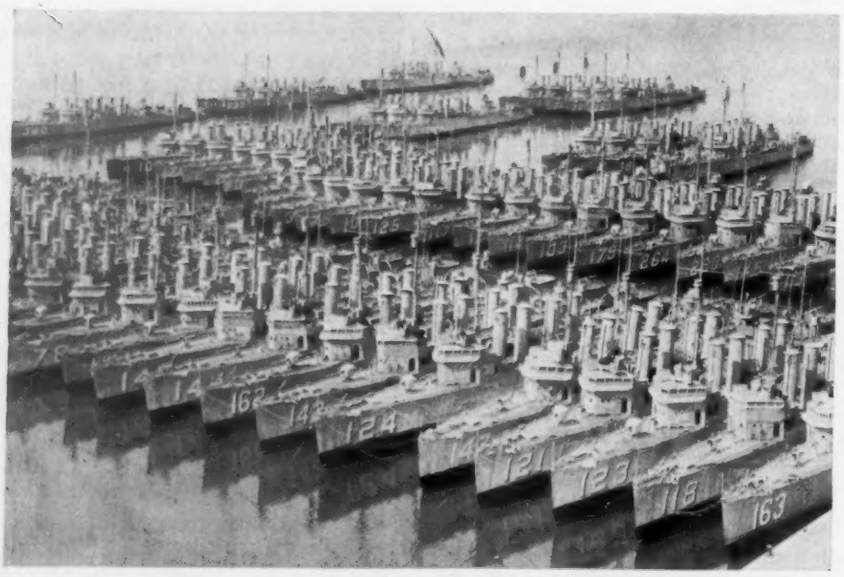
(Gross Tons)

	Pig Iron	Scrap	Finished and Semi-finished
1913	277,648	97,429	2,370,558
1914	114,423	33,134	1,401,997
1915	224,509	79,361	3,228,738
1916	607,236	212,765	5,281,133
1917	656,220	145,574	5,637,273
1918	269,575	2,160	5,103,546
1919	321,261	26,775	4,051,165

Iron and steel price history through the World war, as reported by STEEL (*Iron Trade Review*):

	Pig Iron Basic Valley	Plates Pitts-burgh	Bars Pitts-burgh	Iron, Steel Com-posite
1913	$14.65	1.433c	1.383c	$26.32
1914	12.85	1.158c	1.1646c	22.92
1915	13.80	1.318c	1.32 c	24.76
1916	20.05	3.457c	2.764c	40.50
1917	38.70	3.25 c	3.617c	70.10
1918	32.50	3.25 c	2.90 c	56.68
1919	27.80	2.734c	2.463c	50.32

Destroyers To Be Recalled to Service



■ **Navy department is preparing to press into service 116 of these wartime destroyers, lying since 1918 in "graveyards" at San Diego and Philadelphia. Modern armament and propelling equipment will be installed. Seen possible is their use as convoys for American merchant and passenger ships. NEA photo**

Machine Tool Builders Swamped by Orders; Show Indefinitely Postponed

■ UNPRECEDENTED in the history of major industrial expositions was the indefinite postponement of the National Machine Tool show, to have been held in Cleveland Oct. 4 to 13.

Swamped by a rush of orders, both foreign and domestic, resulting from the outbreak of the European war, many members of the National Machine Tool Builders' association, as well as other exhibitors, reported they found themselves, virtually overnight, in a position where they could spare neither the machine tools nor the key men from their organizations for the period of the show. .

Despite the long, careful planning and the large exposition expenditures already made by the association, its member companies and others, a poll of the membership after the Labor day weekend showed a majority in favor of canceling the show, even though it was less than a month away.

Flood of Bookings

Typical of conditions now facing builders of production machine tools is that reported by one company which has a single unlooked for customer clamoring for immediate delivery of every machine which had been made ready for the Cleveland show. Another instance, indicative of what now may be in store for American machine tool builders, is the switchover of a $10,000,000 Japanese order for machines for the Manchuria Motor Car Co., from Germany to the United States, announced Sept. 7.

There is definite possibility there will be many other large orders from the Orient and from Russia, where Germany, prior to the outbreak of the war, had been supplying many machine tools.

It is certain there will be a great wave of buying on the part of Canada, Great Britain and France. In fact that wave already has begun to roll in on the American companies. Machine tools, while needed for the production of practically everything essential to modern warfare, are not direct instruments of war and therefore do not fall under the ban of our embargo provisions. Hence there appears to be no restriction to their export from the United States to the belligerent nations.

It is remarked by those who recall conditions resulting from the outbreak in 1914, that the present demand for machine tools has burst upon builders in the United States much more suddenly than was the case 25 years ago. In 1914 the eventual five-year boom was preceded by a serious slump immediately following declaration of war.

Regarding the cancellation of the 1939 show and also of the Machine Tool congress which was to have been held in Cleveland in conjunction with it, Wendell E. Whipp, president of the association, made the following statement:

"The members of the association feel that the greatest contribution the industry can make to the welfare of the nation at this time is to concentrate their entire efforts on the production of the greatest possible number of machine tools. Under the circumstances, the industry and its customers cannot afford the time of their key men for a machine tool show, and postponement is felt to be the wisest course.

"The immediate effect of the war is a quickened demand for all of the products of industry. While everyone is conscious of the demand for munitions, the embargo will eliminate that factor in the present situation. However, it has been estimated that munitions were only 10 per cent of our exports during the last World war, and the greatest burden by far that will fall on American industry is to furnish the normal needs of nations who have been trading with the countries now at war and who can no longer be served by them. This great demand for goods of all kinds is reflected in the need for better machine tools."

NATIONAL METAL SHOW TO BE HELD AS PLANNED

National Metal show to be held in Chicago Oct. 23-27 will be held as planned, according to W. H. Eisenman, secretary. Mr. Eisenman reports the exposition will be affected by the war in no way, that hotel reservations now are higher than for last year's show, and that American Society for Metals officials are optimistic for its success.

Single vs. Multistory In Plant Construction

■ Graphic comparison of building and operating costs of single and multistory industrial buildings, together with an analysis of their relative advantages and disadvantages, is presented in the fifth edition of Austin Co.'s booklet "Your New Plant—Multistory or Single Story—Which?"

Current interest in air conditioning and other conditions controls for factories is recognized by a special section on the adaptability of various type plants to such installations.

Bombers Leaving U. S. Before Embargo

■ Despite declaration of a munitions embargo blocking shipments of military aircraft to belligerents, builders are continuing production on heavy orders from Britain, France, Australia. Should the ban on arms exports not be lifted by neutrality act revision, their contracts permit delivery to domestic ports. Lockheed bombers above were among the last to clear Los Angeles harbor

New Mill for Lined Steel Pipe

■ IMPROVED process for manufacturing cement-lined steel pipe for transmission of highly corrosive fluids has been perfected by the Jones & Laughlin Steel Corp., Pittsburgh. Product is made on a new high speed mill especially designed for the purpose by company's engineering department.

A feature of the new plant is a pilot ball mill in which trial batches of the pipe lining mix are ground in order to determine the correct formula for each specific application before production batches are ground in the main ball mill.

Initial shipments of the new pipe have been made to coal mines for sulphur-water disposal systems and to oil fields in Kansas and Oklahoma for salt water disposal lines.

Use Special Formula

In the process, a special formula is used in lining the pipe. A measured quantity of the special mix is placed in the pipe and forced against the walls by a process which, at the same time, extracts a high percentage of the water.

The combination of the special mixture and the process is claimed to produce an even interior coating in the pipe, so smooth that the lining has a lower friction coefficient than the original pipe, yet is strong enough that no special handling in the field is required to protect the lining, except that the pipe cannot be deformed. The pipe can be shipped, cut to length, and fitted just as unlined pipe—the lining being able to withstand without chipping any blow on the exterior of the pipe which does not actually dent the pipe. It has the same working pressures as regular steel pipe, is available in sizes of ⅛ to 12 inches, inclusive, and 14 inches, outside diameter, in special cases.

Hot Dip Galvanizers Announce Research Plans

■ American Hot Dip Galvanizers' association, 903 American Bank building, Pittsburgh, will undertake through its technical research department a study of specifications for galvanizing kettles, including the analysis of steel which will give longest life and factors causing kettle failures. This study was decided upon at the semiannual meeting of the association in Cleveland, Aug. 24-25.

A committee was appointed to study embrittlement in malleable cast iron to provide a basis for recommended galvanizing procedure to insure a top quality job. The organization also decided to continue its present program of activities for another two-year period, ending Jan. 1, 1942. The annual meeting will be held in Pittsburgh in February.

FINANCIAL

COLORADO FUEL & IRON HAS NET PROFIT OF $57,564

■ COLORADO FUEL & IRON CORP., Denver, had a net profit for the fiscal year ended June 30, of $57,564, compared with a net loss of $829,362 in the previous year. Earnings in the second half, which offset losses in the first six months, were buoyed by heavy orders for rails. Average ingot operations throughout the year were 42.5 per cent, against 38.3 per cent the preceding year.

Keystone Steel & Wire Co., Peoria, Ill., had net profit of $897,299, equal to $1.18 a share on capital stock, for the fiscal year ended June 30, compared with net of $727,543, or 96 cents a share, for the previous year.

DIVIDENDS DECLARED

American Rolling Mill Co., Middletown, O., declared $1.25 a share back dividend on the 4½ per cent cumulative convertible preferred stock, payable Oct. 16 to record Sept. 15. Previous payment was $1.12½ a share, July 15, 1938.

Wheeling Steel Corp., Wheeling, W. Va., $1 a share on $5 preferred stock, payable Oct. 2 to record Sept. 12. Previous payment was 50 cents, July 1.

Arthur G. McKee & Co., Cleveland, regular of 25 cents and extra of 25 cents, on class B common stock, payable Oct. 4 of record Sept. 20. Including the present dividend, $3.50 per share will have been paid on this stock during 1939. Although the company has a large volume of foreign work, only a relatively small portion is in England or Europe. Financial condition remains satisfactory with cash and receivables of approximately $900,860 and payables, including 1938 federal taxes due later in the year, of $142,962.

General Electric Co., Schenectady, N. Y., 25 cents per common share, payable Oct. 25 to record Sept. 22. Paid similar amount in previous quarters.

Borg-Warner Corp., Chicago, 25 cents on common, payable Oct. 1 to record Sept. 19. Similar dividend was paid July 1.

Allis-Chalmers Mfg. Co., Milwaukee, 25 cents on common, payable Oct. 4 to record Sept. 18. Like disbursement was made July 3.

MEETINGS

PURCHASING AGENTS SPONSOR BALTIMORE PRODUCTS SHOW

■ FOURTH annual Manufacturers' Products exhibit, sponsored by the Purchasing Agents Association of Baltimore, will be held at the Lord Baltimore hotel, Baltimore, Oct. 24-26. Mill, factory and office equipment will be shown by 100 exhibitors. Frank H. Carter, Maryland Dry Dock Co., is chairman of the committee in charge. Other members include C. C. Copenhaver, Eastern Rolling Mill Co., and A. H. Schultz Jr., Revere Copper & Brass Inc.

KNISELY TO ADDRESS NEW EASTERN ADVERTISING GROUP

Third meeting of the Industrial Advertising and Marketing council at the Elton hotel, Waterbury, Conn., Sept. 18, will be addressed by Stanley A. Knisely, advertising manager, Republic Steel Corp., Cleveland, and president, National Industrial Advertisers' association. His topic will be: "Recent Trends in Advertising to Meet Today's Needs in Industry."

The council is a new organization made up of Connecticut and Western Massachusetts industrial advertising and marketing men. Final organization has just been completed and shortly after the Sept. 18 meeting application for a charter will be made to the National Industrial Advertisers' association.

PROGRAM SET FOR A.I.M.E.-A.S.M.E. COAL CONFERENCE

Recent advances in use of coal will be discussed at the joint meeting of the Coal division, American Institute of Mining and Metallurgical Engineers, and Fuels division, American Society of Mechanical Engineers, at the Deshler-Wallick hotel, Columbus, O., Oct. 5-7. Among topics are: Mining methods, engineering service, new firing equipment, slag research, testing techniques, flame photography, steel melting and the manufactured gas industry.

Of particular interest to the steel and metalworking industries are the following papers at the morning session on Oct. 6: "Use of Pulverized Coal as Fuel for Open-Hearth Furnaces Melting Steel for Castings," by J. P. Kittredge, National Malleable & Steel Castings Co., Sharon, Pa.; "Measurement of Pressures Developed During the Carbonization of Coal," by C. C. Russell, Koppers Co., Kearny, N. J.; and "Coal and Gas," by A. M. Beebe, gas department, Rochester, Gas & Electric Co., Rochester, N. Y.

High-Tensile, Low-Alloy Steel in All-Welded "Snow Cruiser"

■ AMERICA'S claims in South Polar regions will be staked out by a unique steel "snow cruiser" now being built for a government antarctic expedition headed by Rear Admiral Richard E. Byrd.

Specially designed for polar exploration by the Research foundation of Armour Institute of Technology, its owner, vehicle is nearing completion at the Chicago plant of Pullman-Standard Car Mfg. Co. Estimated to cost $150,000, it will be 55 feet long, weigh approximately 75,000 pounds.

The four-wheeled snow traveler combines features of a deluxe trailer, armored tank and scientific laboratory. With fuel enough for a 5000-mile operating radius and a year's provisions for its four-man crew, cruiser will explore an ice area larger than the United States.

Since each two pounds of added weight meant sacrificing one mile in cruising range, its designers sought to attain the lowest weight consistent with structural strength demanded by the rigorous conditions to be confronted. Frame was fabricated from Inland Steel Co.'s high-tensile low-alloy rolled sections, while hot-rolled sheets sheathe the sides and top. Use of electric arc welding in the 16,000-pound frame is said to have made possible a 30 per cent weight saving. Some 550 pounds of electrode were required.

Craft comprises six separate sections—control room, engine room, galley, living quarters, store room and tire compartment. Insulation is designed for comfort in outside temperatures as low as 80 degrees below zero. Its engine room will provide a machine shop and welding equipment for major repairs while on the trail.

Standing 15 feet high on 10-foot rubber tires, the cruiser has a 20-foot wheelbase, will be able to span crevasses 15 feet wide. Operated by one man, it can travel at speeds up to 30 miles per hour, turn virtually in its own length, move sideways at an angle, climb mountains.

Craft's tires are said to be the world's largest pneumatic units. They turn on Timken bearings of 24-inch bore and 32-inch overall diameter, with load capacity of 91,000 pounds at 25 miles per hour and 120,000 pounds at 10 miles per hour.

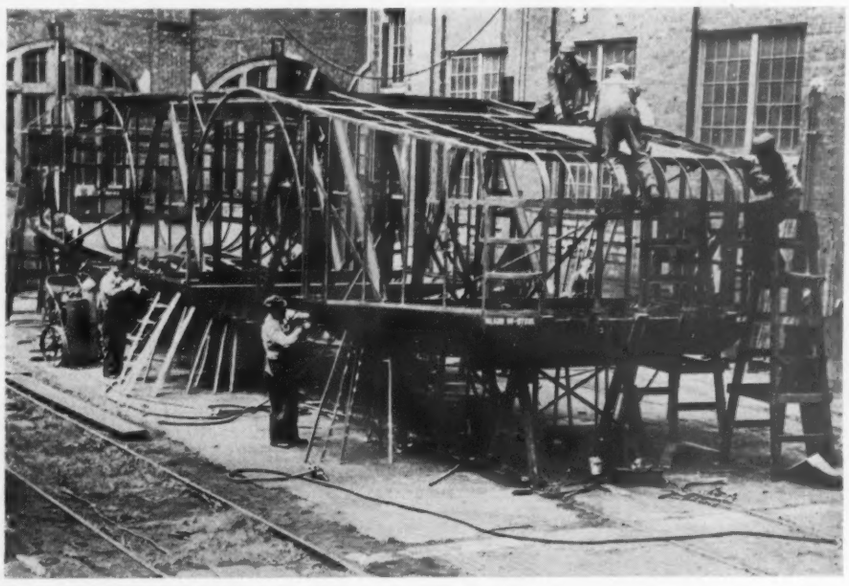
Hydraulic steering is to be used, with front wheels steering independently of the rear wheels, making it possible to shift the cruiser sideways at a 25-degree angle without turning. Wheels will be independently driven by electric motors powered from generators connected to two 150-horsepower diesel engines. The same units are to supply power for lighting and other needs.

All wheels are independently vertically adjustable, so that the cruiser may be lowered to the snow surface, or raised to give four feet clearance. Should it be necessary to change one of the 1200-pound tires, a spare will be lifted from the "hold" by a power derrick and placed in position on the wheel.

Carried on the top deck will be a five-passenger airplane enabling aerial mapping and observation over a 600-mile radius.

Soon to be tested, the snow cruiser leaves next month for the South Pole. At Boston it will be loaded on a freighter for New Zealand, whence it is to be carried by whaling vessel to Antarctica in the Ross sea area.

Cruiser will be the nucleus of the new expedition. Scientists and federal officials assert this mobile base, with range augmented by its airplane, will be able to map and explore in one month more territory than all previous expeditions combined. They anticipate it will place the United States well ahead in the international race to claim antarctic lands.



■ **Byrd's third antarctic expedition awaits this "snow cruiser" now under construction at the Chicago plant of Pullman-Standard Car Mfg. Co. Its all-welded frame required 16,000 pounds of high-tensile low-alloy structural steel members**

Plant Expansions

EXPAND ALUMINUM RESEARCH UNIT AT NEW KENSINGTON

■ CONSTRUCTION of three additions to its research laboratories at New Kensington, Pa., has been launched by Aluminum Co. of America. Aggregating 15,000 square feet, extensions are to be completed Jan. 1. Firm will install a new testing machine with pressure capacity of 3,000,000 pounds in compression and 1,000,000 pounds in tension. This is said to be one of the largest units of its type in the country.

RELIANCE ELECTRIC TO EXTEND FACTORY, OFFICES

Reliance Electric & Engineering Co., Cleveland, has awarded to the J. L. Hunting Co., general contractors, Cleveland, a contract for the construction of a two-story extension to its present office and factory to provide space for a lunchroom for employes, additional room for the company's medical department, more space for factory offices. Extension will cost about $25,000, will be completed by Dec. 1.

MOORE STEAM TURBINE WILL ADD TO PLANT

Contracts for construction of a $150,000 addition to the Wellsville, N. Y., plant of the Moore Steam Turbine Co., subsidiary of Worthington Pump & Machinery Corp., have been awarded to the Austin Co., engineers and builders. Addition will be devoted to the testing and erecting of steam turbines, will be completed in November.

Steel's Presentation Before TNEC Seen Delayed Until Year's End

WASHINGTON

■ STEEL may not be given an opportunity until closing days of this year to present its own story in scheduled hearings before temporary national economic committee, according to present indications.

While detailed plans have not been disclosed as yet, it is expected the justice department's case in connection with TNEC's investigation into monopolistic tendencies in the industry will be three-fold. First part will be a general presentation; the second, technical material; third, rebuttal by the steel industry.

It is now thought the oil industry's hearings before TNEC will be completed by Oct. 15. Unless plans are revised, the justice department will then take up steel's case. Its experts will not haul in a lot of ancient history as did the federal trade commission last year, but will discuss the industry as it exists today, with just enough background to make the present situation clear.

Justice officials are likely to put on record a great deal of statistical data, present summaries and conclusions. During this first phase steel representatives will be present and the figure put into the record by the government will be made available to them before the hearings so that any desired rebuttal may be prepared.

Second phase of hearings probably will be held before a subcommittee of TNEC, owing to the technical nature of material to be presented. Just what this consists of has not been revealed, but the sessions may be in the nature of round-table discussions.

Around Jan. 1 hearings will be allotted to rebuttal testimony of the steel industry. At these sessions steel may handle the case in any manner it sees fit. Witnesses have not yet been selected, and it is probable their names will not be announced until shortly before the hearings.

Questionnaire Replies Heavy

Justice department agents state all of the answers to their steel questionnaires are now in. In the main they are satisfied with the results obtained. Surprise has been expressed at the volume of material submitted.

It is understood TNEC hopes to close its hearings shortly after the first of the year. Committee then will begin drafting a report for submission to congress around April 1.

American Civil Liberties Union has protested an attempt by the committee to inquire into the political, social and economic views of Jones & Laughlin Steel Corp. officers.

In a letter to Chairman O'Mahoney the union asked withdrawal of a committee subpoena directing the company to produce all its correspondence, telegrams and memoranda reflecting the policies, activities and views of the corporation and its officers with respect to anti-trust laws. "The political, social or economic views of persons or corporations are matters which should be no concern to the government," the group asserted.

Pneumatic Self-Loading Welded Steel Scraper

■ **Eight-ton hauling scraper was constructed from welded rolled-steel plates and sections, has pneumatic loading device. Designed to self-load 8 cubic yards of dirt and haul 9.7 yards, scraper was built by Litchfield Machine Shop, Litchfield, Minn., has a total weight of 20 tons. Welding was done with a 300-ampere engine-driven Westinghouse welder**

Steel Employment Increases in July

■ Average number of employes in the steel industry increased during July to 453,000, as against 451,000 in June, according to the American Iron and Steel institute. In July last year, 424,000 were at work in the industry.

Steel payrolls in July totaled $59,900,000, slightly below the June total of $61,150,000, because of the holiday week end, but 30 per cent greater than total payrolls in July 1938 when $45,802,000 was paid to employes.

Hourly earnings of wage-earning employes in the industry averaged 85.9 cents per hour in July, which compares with 84.8 cents in June and with 84.8 cents in July 1938.

Wage earners worked an average of 31.0 hours per week in July, as against 33.5 hours per week in June and 24.3 hours per week in July a year ago.

Takes Over 40-Year Old Firm Making Skylights

■ W. F. Hirschman Co., Buffalo, maker of roof ventilators and auxiliary equipment, has acquired all properties of the G. Drouve Co. Inc., Bridgeport, Conn. Drouve has been a manufacturer of puttyless skylights for the past 40 years.

Its production machinery now is being transferred to the Hirschman plant.

Actual Pig Iron Output

■ Pig iron production for August as carried in STEEL, Sept. 4, p. 20, was compiled from producers' reports estimated for the last day or two of the month. Actual production figures now available show total monthly output was 2,660,513 gross tons with average daily output at 85,823 tons. This is somewhat lower than first reported.

Also, due to typographical error in producer's report, one furnace was reported as added when it actually was not. This was in Pennsylvania, one Swede, Alan Wood Steel Co.

August Ingots in 19 Per Cent Rise

■ AUGUST steel ingot production totaled 3,763,718 gross tons, highest monthly output since September, 1937, according to the American Iron and Steel institute. This was 19 per cent greater than the revised total for July, 3,162,534 tons, and nearly half again as large as the 2,537,102 tons produced in August, 1938.

August production was at 62.22 per cent of capacity, compared with the revised figure of 52.40 per cent for July and with 42.68 per cent for August, 1938.

An average of 849,598 tons was produced weekly in August, against revised average weekly output of 715,505 tons in July and 572,709 tons per week in August last year.

Production in eight months totaled 25,556,179 tons, compared with 15,300,002 tons in the same period in 1938. Average weekly output for eight months was 736,065 tons, compared with 440,667 tons in the first eight months of 1938.

World Tin Output Down, U. S. Consumption Larger

■ World tin production in first half, 1939, totaled 62,800 gross tons, compared with 82,500 tons in the corresponding period last year, according to figures of the International Tin Research and Development council, The Hague. Production for the first half of 1937 was stated as 92,203 tons.

World apparent tin consumption in first half, this year, was 74,900 tons, 6000 tons below first half, 1938, but 4000 tons above that in second half. Russia showed a decrease of 60 per cent; Germany, 19 per cent; France, 10 per cent; and Japan 9 per cent. Apparent consumption increased 18 per cent in the United States and 13 per cent in the United Kingdom.

World tin plate production in first half, 1939, was 1,900,000 tons, against 1,500,000 tons in the corresponding period, 1938, a gain of 27 per cent.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Sept. 9	Change	Same week 1938	Same week 1937
Pittsburgh	55	— 4	32	69
Chicago	51	— 3	38	73
Eastern Pa. ..	46	+ 2	31	64.5
Youngstown ...	57	+ 1	44	65
Wheeling	80	— 6	49	76
Cleveland	68	—12	43.5	62
Buffalo	60.5	None	49	79
Birmingham ..	70	— 5	56	91
New England .	70	None	60	65
Cincinnati	57	— 9	60	89
St. Louis	62	—1.5	42	77
Detroit	99	+ 9	67	100
Average	62	— 2	41.5	72

Steel Ingot Statistics

Calculated Monthly Production—All Companies

	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	—Total— Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
1939	**Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.**							
Jan.....	3,026,710	54.96	147,642	27.26	3,174,352	52.48	716,558	4.43
Feb.....	2,792,267	56.15	196,382	40.16	2,988,649	54.72	747,162	4.00
March.....	3,210,481	58.30	194,889	35.99	3,405,370	56.30	768,707	4.43
April.....	2,768,269	51.91	205,977	39.28	2,974,246	50.78	693,297	4.29
May.....	2,752,549	49.98	170,326	31.45	2,922,875	48.32	659,791	4.43
June.....	2,937,622	55.08	187,666	35.78	3,125,288	53.35	728,505	4.29
July.....	2,932,924	53.38	229,610	42.49	3,162,534	52.40	715,505	4.42
Aug.....	3,516,219	63.85	247,499	45.70	3,763,718	62.22	849,598	4.43
8 mos....	23,976,188	55.60	1,579,991	37.20	25,556,179	53.80	736,065	34.72
1938	**Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.**							
Jan.....	1,634,224	30.28	99,941	18.27	1,734,165	29.17	391,459	4.43
Feb.....	1,572,009	32.26	125,443	25.39	1,697,452	31.63	424,363	4.00
March.....	1,846,517	34.21	157,687	28.82	2,004,204	33.72	452,416	4.43
April.....	1,786,942	34.19	132,100	24.93	1,919,042	33.34	447,329	4.29
May.....	1,669,455	30.93	131,422	24.02	1,800,877	30.30	406,519	4.43
June.....	1,513,715	28.96	119,128	22.48	1,632,843	28.36	380,616	4.29
July.....	1,846,319	34.29	127,998	23.45	1,974,317	33.29	446,678	4.42
Aug.....	2,340,363	43.36	196,739	35.96	2,537,102	42.68	572,709	4.43
8 mos....	14,209,544	.....	1,090,458	.....	15,300,002	.....	440,667	34.72
Sept.....	2 440,192	46.80	206,937	39.15	2,647,129	46.09	618,488	4.28
Oct.....	2,882,827	53.41	223,158	40.78	3,105,985	52.25	701,125	4.43
Nov.....	3,357,167	64.23	201,196	37.97	3,558,363	61.81	829,455	4.29
Dec.....	2,971.834	55.19	158.912	29.11	3,130,746	52.79	708,314	4.42
Total.....	25,861,564	40.71	1,880,661	29.20	27,742,225	39.65	532,072	52.14

Percentages of capacity operated for 1939 are calculated on weekly capacities of 1,243,153 gross tons open-hearth ingots and 122,248 gross tons bessemer ingots: total, 1,365,401 gross tons: based on annual capacities as of Dec. 31, 1938, as follows: Open-hearth ingots, 64,817,994 gross tons; bessemer ingots, 6,374,000 gross tons.

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots: total, 1,341,856 gross tons: based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

PRODUCTION

■ STEELWORKS operations last week receded 2 points to 62 per cent in the weekly average, due to Labor day interruption. At the week's close the rate was much higher and this week will show a material increase. Three districts showed slight increases, seven declined and two remained stationary. Last year the rate was 41.5 per cent; two years ago 72.

Youngstown — Advanced 1 point to 57 per cent with schedules for this week indicating an increase of 7 points to 64 per cent, a two-year high. Further rise is expected to follow.

Chicago — Declined 3 points to 51 per cent, because of Labor day curtailment. Resumption by one plant down several weeks for new equipment installation tempered the holiday interruption.

Detroit — Up 9 points to 99 per cent, virtual capacity, highest since the fall of 1937.

St. Louis — Shifts in active open hearths resulted in a net loss of one, the rate losing 1.5 points to 62 per cent.

Birmingham, Ala. — Off 5 points to 70 per cent as one open hearth was taken off, leaving 16 active.

Buffalo — Unchanged at 60.5 per cent with indications of increased activity within the next fortnight.

New England — Steady at 70 per cent for the fifth week.

Central eastern seaboard — Gain of 2 points to 46 per cent as all producers enlarge output.

Wheeling — Temporary adjustment at one plant lowered the week's rate to 80 per cent, a decline of 6 points.

Pittsburgh — Down 4 points to 55 per cent for the week's average, with production at 60 per cent at the close. Indications are that this week will see a rise of 10 to 15 points as all interests add to production.

Cleveland — Holiday suspensions by some mills cut the week's average 12 points to 68 per cent. Recovery to near 80 is indicated this week.

Cincinnati — Shutdowns over the holiday lowered the week's average 9 points to 57 per cent, although the rate was 66 per cent as the week closed.

Sloss Sheffield To Make Quality Ferromanganese

■ Production of a high-grade ferromanganese will be started immediately by Sloss Sheffield Steel & Iron Co., Birmingham. Firm's No. 4 blast furnace at North Birmingham has been assigned.

MEN OF INDUSTRY

■ WILSON H. MORIARTY has been promoted to sales manager, Cleveland works, National Malleable & Steel Castings Co., Cleveland. Mr. Moriarty joined the company in 1919, following graduation from Case School of Applied Science, and army service. He was resident inspector, East St. Louis plant and later Chicago and Cleveland plants, subsequently became chief inspector for all National Malleable & Steel Castings plants. He has been in the sales division since 1931, is the inventor of a grate bar used in sintering plants throughout the smelting industry.

♦

Charles E. Webster recently was appointed general manager, Timken Roller Bearing Co. Ltd., 55 Charles St., West, Toronto, Ont. A Canadian by birth, Mr. Webster has been associated with Timken sales activities for 20 years.

♦

Edward Ranck has been appointed to the sales staff, Gar Wood Industries Inc., hoist and body division, Detroit.

♦

Carl Sturmer has been appointed general superintendent, Newark, N. J. plant, Sherwin-Williams Co., Cleveland. Mr. Sturmer has been at the Chicago plant of Sherwin-Williams for the past 13 years, as superintendent of the lacquer plant and production superintendent of lacquer, paint, varnish. He replaces G. L. Hehl who has become eastern manager for North Atlantic, South Atlantic, New England districts.

♦

George A. Delaney, electrical engineer, Pontiac Motors division, General Motors Corp., has been chosen chairman, Detroit section, Society of Automotive Engineers.

♦

John P. Hoelzel, vice president, Pittsburgh Screw & Bolt Corp., Pittsburgh, has been elected president to succeed Charles R. Ferguson, new chairman of the board. Mr. Ferguson succeeds John F. Miller, resigned, who will be a director and vice chairman.

♦

Francis A. Calden has joined the hydraulic press sales staff, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa. A graduate of Franklin Union Engineering institute and

Wilson H. Moriarty

Massachusetts Institute of Technology, Mr. Calden formerly was affiliated with the E. W. Bliss Co., Brooklyn, N. Y., and Akerlund & Semmes, New York.

♦

A. B. Hall, manager, metal department, National Lead Co., New York, has retired after 50 years' service. Mr. Hall joined the company in 1889 as a runner for its predecessor and became manager of the metal department in 1907. E. R. Dondorf, who has been associated with the company since 1906, succeeds Mr. Hall.

♦

M. L. Jacobs, formerly general manager, limestone properties, Bethlehem Steel Co., has been appointed assistant to vice president. He started with Bethlehem in 1917, as superintendent of the Steelton quarry, and since has been superintendent

Francis A. Calden

of both the Bethlehem and Bridgeport quarries.

J. P. Peacock has been appointed successor to Mr. Jacobs. Hubert Merryweather was selected general manager of ore properties for the company.

♦

J. Henry Crane has been elected president of the American Centrifugal Corp., New York, succeeding Stuart Otto, resigned. George E. Henkel, chief engineer, was named a director.

♦

Roy E. Smith, manager, Chicago division, W. Q. O'Neall Co., Springfield, Ill., has been appointed general manager of the firm. He has been with the company since 1928 as sales engineer, promotional engineer, Illinois division manager. W. Q. O'Neall Co. is a subsidiary of the American Rolling Mill Co., Middletown, O.

♦

R. H. Osborn has resigned his position as general manager, Neveroil Bearing Co., Wakefield, Mass. E. V. Morrow, treasurer of the firm, has been appointed to succeed him.

♦

Wilfred S. McKeon has been named president of the Century Fittings Co., Greensburg, Pa., succeeding the late William J. Burkart, founder of the organization.

♦

J. F. Bekola has been appointed head of the Thomas Steel Co., Warren, O., metallurgical department. Mr. Bekola was formerly connected with the metallurgical department of the Warren plant, Republic Steel Corp., Cleveland.

♦

Raoul Desvernine, president, Crucible Steel Co. of America, New York, will be principal speaker at a meeting of the American Institute of Electrical Engineers, eastern district, held at Hotel Casey, Scranton, Pa., Oct. 12.

♦

M. H. Morris has been selected president, Morris Machine Works, Baldwinsville, N. Y. J. L. Lonergan was appointed vice president and general manager, after 37 years' service with the firm. A. G. Forssell has been named second vice president, R. S. Mercer reappointed secretary and treasurer.

♦

J. A. Bouffard, pig iron and coke sales manager, The Hamilton Coke & Iron Co., Hamilton, O., subsidiary of American Rolling Mill Co., Middletown, O., has resigned, effective Sept. 30, to join Milwaukee Solvay Coke Co., Milwaukee, where he will have similar duties. He will be associated with J. A. B. Lovett, former head of the Hamilton company

and now president of the Milwaukee firm.

♦

R. B. Nichols has been elected secretary, Bantam Bearing Corp., South Bend, Ind., subsidiary of The Torrington Co., Torrington, Conn. He has been active in the bearings business for the past 15 years, most of this time at Bantam. In addition to his new duties, Mr. Nichols will continue as sales manager, a position he has held for the past three years.

♦

W. S. Murphey, P. O. Box 485, Charlotte, N. C., has been appointed district sales engineer for Harnischfeger Corp., Milwaukee. He will work in and around North Carolina, selling electric hoists, welders, electrodes, excavators.

♦

W. Robert Timken has been appointed assistant to the president, The Timken Roller Bearing Co., Canton, O. A graduate of Harvard university in 1933, he has been active in office and factory, serving in various capacities.

♦

Maurice G. McCall has been selected to direct the recently organized technical department of the accessory sales division, Stewart-Warner Corp., Chicago.

♦

Pedro C. Morales, Chopo 24, Mexico, D. F., has been selected Mexico representative for Iron & Steel Products Inc., Chicago. Formerly general superintendent, machinery and motive power, national railways, Mexico, Senor Morales succeeds L. N. B. Bullock.

♦

Ray P. Tarbell has joined Una Welding Inc., Cleveland, as sales engineer, specializing in automatic welding applications. He formerly

William A. Ross

Who as noted in STEEL, Sept. 4, page 24 recently was elected president, Columbia Steel Co., subsidiary of United States Steel Corp.

R. B. Nichols

was connected in similar capacities with the Lincoln Electric Co., Cleveland, Babcock & Wilcox Co., New York, was associated with Robert E. Kinkead, consulting welding engineer, Cleveland.

♦

J. T. McFarland has been appointed manager, St. Louis branch office, for Hagan Corp., Pittsburgh, and its subsidiaries. A graduate of Purdue university, Mr. McFarland comes to Hagan with a 20-year background of sales engineering.

♦

John S. Bartek has been added to the engineering staff, Pioneer Engineering & Manufacturing Co., 31 Melbourne avenue, Detroit, as specialist in threading and threading problems. He formerly was chief engineer, Modern Tool Works, Rochester, N. Y.

DIED:

■ RICHARD B. WOODWARD, 69, general shop and field superintendent for the William B. Pollock Co., Youngstown, O., Aug. 30. He had been employed by the Pollock company for 35 years, during which time he supervised construction of 55 blast furnaces.

♦

Haskins Williams, 67, senior partner of the Birmingham Rail & Locomotive Co., in Birmingham, Ala. He was co-founder of the company which has been handling railroad equipment since 1896.

♦

Ernest H. Baldwin, 73, president, Rogers & Baldwin Hardware Co., Springfield, Mo. Mr. Baldwin, a life member of the American Society of Civil Engineers, was a nationally known civil engineer.

♦

James H. Reid, 66, general manager Freeport Brick Co., Freeport, Pa., Sept. 4. He had been associated with the company since 1918.

♦

Dr. E. M. Parlett, 59, industrial hygienist for Columbia Steel Co., San Francisco, Aug. 21, at San Mateo, Calif. He had been associated with United States Steel Corp., since 1920, joining Columbia Steel Co., in 1930.

♦

Aubrey Weymouth, 66, vice president, Post & McCord, structural engineers, New York.

♦

Thomas J. McLane, 59, vice president, Poirier & McLane Inc., New York contracting firm, in that city, Sept. 3.

♦

Richard F. Stewart, 77, inventor and manufacturer of machines for cutting, printing, wrapping butter, in Scarsdale, N. Y., Sept. 1. He retired in 1932 as head of the American Butter Cutting Machinery Co., New York and Elmsford, N. Y.

♦

Julius F. Janes, 63, patent broker, former head of several industrial plants in Cleveland, including Standard Steel Castings Co., Warm Air Furnace Co., in that city, Sept. 4.

♦

Loran J. Harvey, general foreman, West Lynn, Mass. plant, General Electric Co., Schenectady, N. Y., at his home, Swampscott, Mass., Aug. 24.

♦

Charles G. Zellmer, 53, stores keeper, National Malleable & Steel Castings Co., Cleveland, Sept. 7.

♦

DeWitt Clinton Moon, 83, general manager of the old Lake Shore and Michigan Southern railroad, at his home in Cleveland, Sept. 6.

♦

Elmer F. Blakeslee, 49, vice president and Pittsburgh district manager, Stone & Webster Engineering Corp., at his home, Englewood, N. J., Sept. 3.

♦

Charles Donnelly, 69, president, Northern Pacific railroad, Sept. 4., in St. Paul.

♦

Frank E. Gooding, a contributing editor of STEEL, at his home in Fairbury, Ill., Aug. 31. Mr. Gooding, a graduate of Illinois university, had been associated with STEEL since 1935 and wrote many articles on power drives and other technical subjects. He was past president, Western Efficiency society, Chicago chapter, Society of Industrial Engineers, Business Editors of Chicago.

♦

W. Charles Panzer, 54, co-founder the Northwestern Brass, Bronze & Aluminum foundry, Detroit, in that city, Sept. 5.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ COMMERCE department officials believe American exports of machinery and iron and steel to South America will be greatly increased due to the war in Europe. Germany especially has been selling large quantities of machinery there.

A conference of the American republics has been called by Panama and will probably be held the latter part of this month, although the date has not yet been announced. Maintenance of peace in the western hemisphere, as well as maintenance of normal trade and the prevention of financial disturbances will be discussed. There is no question but what at this conference particular emphasis will be laid on the trade situation.

Edward J. Noble, acting secretary of commerce, pointed out specifically last week that the United States has an opportunity to greatly expand its trade with South America and he said his department is interested in working in co-operation with American business to keep prices reasonable in order to further this opportunity.

Seek Reasonable Prices

He said the United States and Germany have been the chief exporters to South America, and that now this country has a chance to broaden its South American outlet.

The commerce department, he explained, is interested in the anti-profiteering problem because it is anxious that prices be maintained on a reasonable basis. He recalled that during the last war there was some criticism from South America that prices jumped. Referring to the proposed co-operation with business interests to avoid this possibility, he referred to it as "just reasonable good common sense." The acting secretary discussed the South American trade situation after leaving the White House but did not indicate that it had been discussed with the President.

Some interesting figures are available at the commerce department relative to German exports of various types of machinery for 1938. These figures show for instance that during 1938 Germany exported approximately $5,500,000 worth of diesel marine engines, of which approximately $4,000,000 worth went to European countries and the remainder chiefly to South America. During the same year, Germany exported $8,500,000 worth of stationary diesel engines, of which some $3,000,000 worth went to European markets and the remainder largely to South America.

Significant also is Germany's exportation of metalworking machinery which was valued at approximately $70,000,000, of which $50,000,000 worth went to European countries and the remainder to South America. These figures are typical of the many other machinery exports of Germany. Farm implements and machinery, including tractors, for instance, valued at approximately $18,000,000 were exported by Germany last year; $12,000,000 worth went to European markets and $6,000,000 to South America.

Last year, the United States exported a total of approximately $100,000,000 worth of power-driven metalworking machinery, of which only $725,000 worth went to Central America with approximately $2,000,000 going to South America. In 1938 also, the United States exported a total of $63,000,000 worth of mining, well and pumping machinery, of which some $12,000,000 worth went to Central America and $16,000,000 worth to South America.

LAWS INADEQUATE TO CURB PROFITEERING PRACTICES

President Roosevelt last week requested the department of justice to make a study of the profiteering situation. Attorney General Murphy told newsmen that existing laws to stop runaway prices are entirely inadequate, which led to the assumption that justice officials will draft new legislation to take care of this situation. It is expected that the department will make public some statement regarding this in the near future.

The war resources board and other government departments are co-operating with the department of justice in possible price control measures.

Various administration economists, at the request of the war resources board, are closely watching commodity price trends as a means of preparing a remedy for profiteering.

CENSUS TO LIST WORKERS FOR POSSIBLE WAR NEEDS

Government officials have announced that 1940 census takers will ask workers not only what kind of work they are doing but what they usually do. This is at the request of the war department in an effort to find out how many trained workers would be available to meet the needs of industry and the armed forces in the event the United States became involved in war.

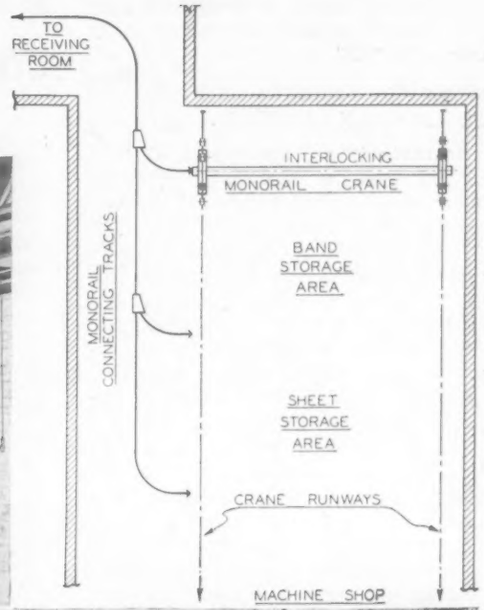
This would give the best possible idea of man power available in various occupations, it is said, because unemployment during and since the depression had caused many workers to leave their customary lines of work.

One of the government's hardest tasks in event of war, some officials said, would be to meet needs of army and navy for trained mechanics and other workers without handicapping the nation's various essential industries.

The war resources board has discovered what army officials have long known, that little exact information is available as to the number

Low-cost Handling System

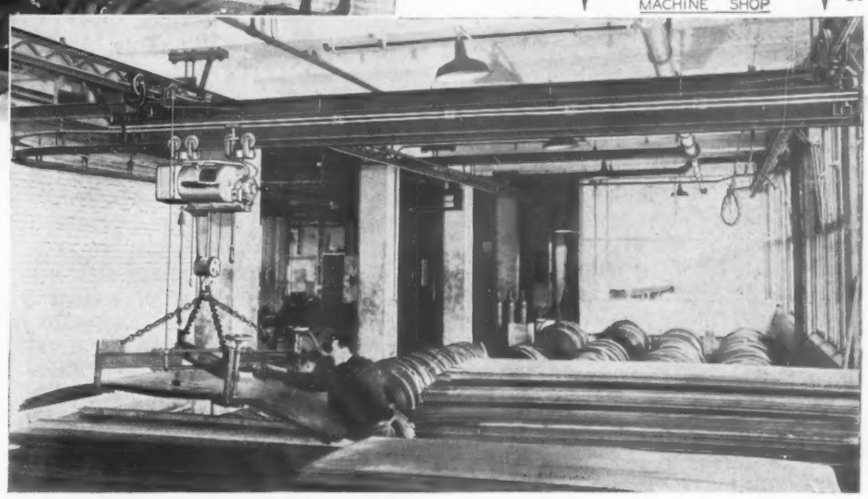
Steel moves from receiving dock to storage over this simple American MonoRail system at low handling cost.



Special coil hook, electric hoist, crane and connecting tracks make up a system that permits one-man control of the entire stock.

•

Manually operated sheet grab assures safe handling of unit loads direct to process machines, eliminating damage or re-handling of individual sheets.



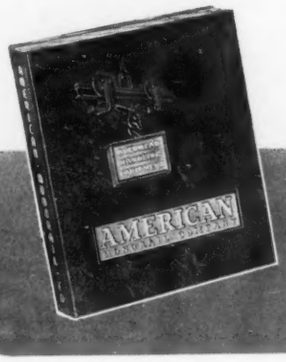
•

A 254 page book used as a technical reference for all data covering Mono-Rail equipment will be sent on letterhead request.

Since no two overhead handling problems are alike, low-cost solutions are found only in a system that offers extreme flexibility of basic design.

American MonoRail equipment meets varying requirements at low initial cost because standard parts of such flexible design are fabricated into special units and co-ordinated into systems guaranteed to produce the results intended.

For either manual, electric or automatic operation these systems invariably overcome operating congestion, eliminate costly maintenance and reduce handling expense wherever applied. Engineering consultation is available without obligation.



THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND, OHIO

of experienced workers who would be available in the crafts.

Spokesmen for the social security board said the best information it could supply the war resources group was that 30,157,694 persons between the ages of 15 and 65 had paid old-age insurance taxes on their wages in 1937.

FRANCE SUBJECTS IMPORTS TO LICENSE CONTROL

Imports into France and Algeria of all foreign merchandise have been made subject to import license, according to a cablegram from the American embassy at Paris. French and Algerian firms desiring to import foreign merchandise must obtain licenses which will be good for four months period in case of imports from non-European countries and three months in the case of imports from European countries.

As a transitory provision, exemption from the new licensing requirement is made for two classes of shipments. Foreign merchandise which was not subject to quota control or import prohibition into France prior to Sept. 2 may be imported under the conditions previously in force when it can be established that the merchandise had been shipped directly to France or Algeria before that date. Merchandise subject to quota control or other import restrictions into France prior to Sept. 2 will be admitted as usual if licenses or quota certificates had been delivered prior to that date, and it is imported before the expiration of the normal period of validity of these documents.

GREAT BRITAIN ANNOUNCES WAR CONTRABAND LIST

British embassy last week announced a long list of articles which are considered contraband of war in the United Kingdom. Included are all kinds of arms, ammunition, explosives or machines for their manufacture or repair. Also included are machine tools and implements of all kinds used for war preparation.

WPA MATERIAL PURCHASES TOTAL NEARLY $1,700,000,000

Private industrial concerns and equipment contractors have received nearly $1,700,000,000 in orders for purchase of construction materials and equipment and rental of equipment for use on WPA projects.

A tabulation just made public by WPA states that about $200,000,000 has been spent for iron and steel products, making up nearly one-fifth of the total purchases, while 4 per cent or $45,000,000 has been spent for machinery.

The exact total for iron and steel products as given by the WPA is $195,749,233, made up as follows: Cast iron pipe and fittings, $57,062,241; heating and ventilating equipment, $9,789,798; structural and reinforcing steel, $48,842,142; tools, excluding machine tools, $18,632,935; and other iron and steel products, $61,422,117.

MORE STEEL CORN BINS TO STORE SURPLUS GRAIN

The department of agriculture has announced the purchase of 6400 steel grain bins with storage capacity of 13,526,000 bushels.

These are in addition to the 25,800 bins with a capacity of 43,900,000 bushels for which contracts were let during August. They are being purchased by the commodity credit corporation to store at country points corn which may be delivered in settlement of corn loans which matured Aug. 1. All the bins are of approximately 2000 bushels capacity. The cost will average about 8 cents per bushel of storage capacity. Delivery is scheduled to be completed by Oct. 10.

Officials announced that about 3000 bins from previous purchases have already been shipped to Iowa, Illinois, Missouri, Minnesota, South Dakota and Nebraska. They are set up in many cases with co-operation of local elevators and are supervised by county agricultural conservation committees.

Corn will be stored until prices justify its movement into commercial trade channels.

Successful bidders are as follows: Beatrice Steel Tank Co., Beatrice, Neb.; Columbian Steel Tank Co., Kansas City, Mo.; A. N. Eaton Metal Products Co., Omaha; Stefco Steel Co., Michigan City, Ind.; Perfection Steel Body Co., Galion, O.; James Mfg. Co., Fort Atkinson, Wis.; Martin Steel Products Co., Mansfield, O.

LOCOMOTIVE, CAR REPAIR CAN ADD 45% CAPACITY

Railroads of the United States can handle at least 25 per cent more traffic than they are now handling, and by repairing approximately 200,000 freight cars and 8000 locomotives now awaiting repairs and not required for present traffic, they could handle 45 per cent more than the present business, J. J. Pelley, president of the Association of American Railroads, said last week, discussing possibilities of increased railroad traffic because of the war situation.

Mr. Pelley said: "If and as additional equipment is required it can be had, and the railroads can and will keep ahead of any demands that may be made upon them.

"These conclusions are the result of a very careful study made several months ago. It is a fact that there has been a great reduction in the amount of equipment owned. It is also a fact that there has been a great increase in the efficiency of movement. For example, the average speed of freight trains between terminals is now 61 per cent greater than in 1920 and the tons handled per train-hour, which is the real measure of work, have increased more than 100 per cent since 1920. It is conservatively estimated that the traffic of 1929, the largest in history, could now be handled efficiently with from 350,000 to 400,000 cars less than were owned at that time."

GRINDING WHEEL STANDARD REVISION IS ISSUED

Division of simplified practice, national bureau of standards, has announced that printed copies of the fourth revision of simplified practice recommendation R45, grinding wheels, are now available. This revision, which became effective June 1, is identified as R45-39.

WALSH-HEALEY STEEL PURCHASES ARE HEAVY

During the week ended Aug. 26, the government purchased $396,972.77 worth of iron and steel products under the Walsh-Healey act as follows: United States Steel Products Co., Washington, $47,892.58; Aluminum Co. of America, Washington, $14,751.75; E. Behringer Sheet Metal Works Inc., Newark, N. J., $30,375.00; C. O. Jelliff Mfg. Corp., Southport, Conn., $11,024.11; Walworth Co., New York, $11,410; Inland Steel Co., Chicago, $74,400 (estimated); Allegheny Ludlum Steel Corp., Watervliet, N. Y., $48,225 (estimated); John J. Riley Co., Brooklyn, N. Y., $11,239.50; Joseph T. Ryerson & Sons Inc., Chicago, $31,988.04; Jones & Laughlin Steel Corp., Pittsburgh, $51,310.57; and Beatrice Steel Tank Mfg. Co., Beatrice, Neb., $52,188.80.

During the week ended Sept. 2 purchases totaled $1,087,964.19 as follows: Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., $21,649.65; The Midvale Co., Washington, $26,100; Bethlehem Steel Co., Bethlehem, Pa., $609,000; Crucible Steel Co. of America, New York, $67,550; The Steel Improvement & Forge Co., Cleveland, $51,175; John W. Beam, Denver, $14,450; Crucible Steel Co. of America, New York, $47,125; General Electric Supply Corp., New York, $31,108.52; Capitol Steel Co. of New York, New York, $17,224.60; Hall-Hodges Co. Inc., Norfolk, Va., $22,752.10; Treadwell Construction Co., Midland, Pa., $38,661; Mitchell Metal Products Inc., Cleveland, $87,325; Locke Insulator Corp., Pittsburgh, $19,031.32; and Lundquist Tool & Mfg. Co., Worcester, Mass., $34,812.

Nation's Air Progress Depicted In Exhibit at New York Fair

■ HOW American aeronautics grew to major industrial importance since cradled at Kitty Hawk 36 years ago is the dramatic story told in the aviation building at the World's fair.

With manufacturers, airlines, flying schools and federal agencies taking part, exhibit is designed to arouse public imagination and interest, convey a broad conception of aviation's accomplishments and the role it plays in modern life.

One of the fair's most popular exhibits, the building has already been toured by nearly 3,000,000 persons. Visitors now exceed 20,000 daily, and attendance is increasing steadily.

Building's front simulates an airport office, while the remainder resembles the wingless body of a giant airliner moving into a semicircular hangar. Requiring 435 tons of steel, the 60,000-square foot structure has steel frame covered with asphalt-coated corrugated sheet. Three-hinged plate girder arch construction was employed to attain a 94-foot overall height.

Upon entering visitors perceive four army and navy fighting planes suspended from the ceiling in diving "attack" position. Realism is added by periodical roaring of engines and flashing of airway beacons.

Exhibit is divided into sections on air transport, private flying and national defense. Each relates its own story of airplane development.

Growing safety and reliability of airline operations are pointed to in the transport section. Here visitors pass through a full-sized reproduction of Curtiss-Wright's new 36-passenger substratosphere skyliner, the CW-20. One side of the 18-ton craft is cut away to permit inspection.

Adjacent to the plane is a large map showing all Eastern airlines. On this civil aeronautics authority demonstrates airway traffic control, using markers to indicate the movement of transport ships and reproducing through loudspeakers actual two-way radio exchanges between dispatchers and pilots.

Show Flying Aids

At one end of the building airlines display the many ground aids to commercial flying. Included: Meteorology, dispatching, pilot training, medical examinations, engine, propeller and instrument maintenance. Replica of a pilot's cabin shows the functions of instruments and radio, while a Link "trainer" demonstrates instrument flying and blind landings.

Prominently located nearby is a ticket desk where passage may be booked on any airline in the world.

Private flying exhibit portrays the airplane's usefulness to the individual owner for business and pleasure. Representative low-priced aircraft are on display. Raised on a giant screen are American aviation's vital statistics as of Jan. 1: Some 23,000 licensed pilots; 12,000 licensed planes; over 2300 airports.

Army and navy displays graphically illustrate aviation's importance to national defense. A ramp leading to its cockpit permits inspection of the navy's latest and swiftest fighter. This craft, together with the four suspended and nine scale models, provide a "who's who" of our military air units. Other displays contain bombs, aerial cannon, machine guns and armament accessories.

Research as an essential factor in air progress is stressed by the National Advisory Committee for Aeronautics with replicas of wind tunnels and other experimental equipment.

Supplementary displays by leading manufacturers present all types of engines, propellers and parts. Striking evidence of how far aviation has come is depicted by an exhibit contrasting a two-cylinder power plant built in 1914 with a modern 1500-horsepower, 14-cylinder Wright Cyclone engine and the latest 1600-horsepower, 18-cylinder Pratt & Whitney motor.

Accompanying general exhibits of the latest air-cooled radial and liquid-cooled inline engines are modern propellers delicately fanning the air in demonstrating their full-feathering mechanisms. Other displays include instruments, radio, starters, generators, magnetos, sparkplugs, engine parts, landing gear and miscellaneous accessories.

Manufacturers exhibiting: Aeronautical Corp. of America, American Armament Corp., Aviation Mfg. Corp., Bendix Aviation Corp., B. G. Corp., Brewster Aeronautical Corp., Champion Spark Plug Co., Cleveland Pneumatic Tool Co., Curtiss-Wright Corp., Elastic Stop Nut Corp., Grumman Aircraft Engineering Corp., Walter Kidde & Co., Kollsman Instrument Co. Inc., Liquidometer Corp., Piper Aircraft Corp., Sperry Gyroscope Co. Inc., and United Aircraft Corp.

■ **Phenomenal progress of the aircraft industry is portrayed by the aviation exhibit at the New York World's fair. One of the fair's most popular buildings, its daily attendance now exceeds 20,000, is growing steadily**

Steel, Equipment Firms Active in Aviation Classic

■ Symbolizing the steel industry's growing interest in aeronautics is the prominent role played by Allegheny Ludlum Steel Corp. and metal-working firms in the National Air Races held at Cleveland Sept. 2-4.

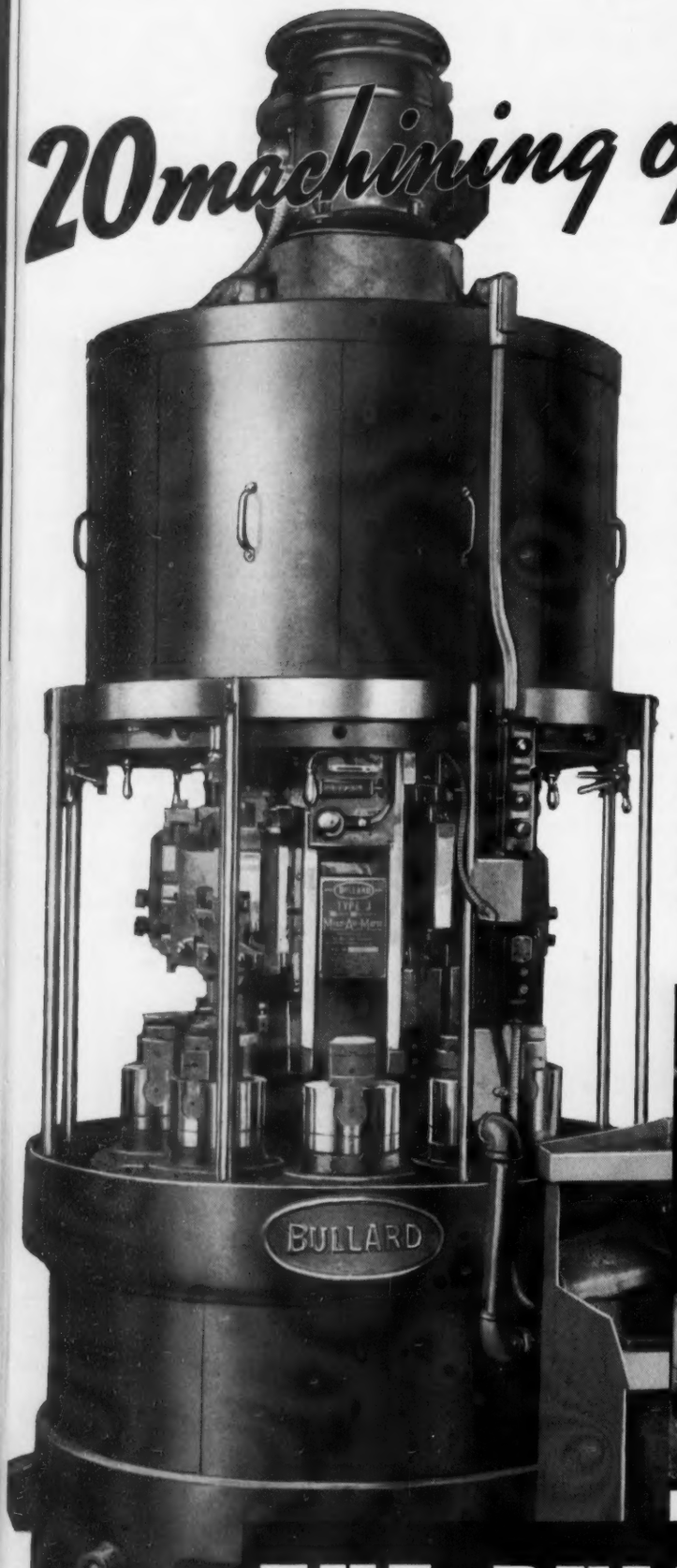
At a National Aeronautical association dinner in Hotel Cleveland to formally open the races, Allegheny Ludlum's aeronautical sales director, T. Coolidge Sherman, presented stainless steel achievement awards to flyers who had qualified for the Thompson trophy speed event.

Since Col. Roscoe Turner, winner of the Thompson race, failed to attain a new speed record, the firm this year did not award its special trophy and $2000 purse in the event.

Pilots in the Greve and Thompson closed-course speed dashes in addition to cash prizes competed for trophies offered by L. W. Greve, president, Cleveland Pneumatic Tool Co., and Fred C. Crawford, president, Thompson Products Co.

ROUGH FACE A SURFACE	FINISH FACE L SURFACE
ROUGH FACE B SURFACE	FINISH TURN C SURFACE
ROUGH FACE K SURFACE	ROUGH FACE D SURFACE
BORE H HOLE	FINISH FACE A SURFACE
ROUGH TURN C SURFACE	FINISH FACE B SURFACE
ROUGH FACE L SURFACE	FINISH FACE K SURFACE
CHAMFER F SURFACE	GROOVE J SURFACE
DRILL F HOLE	GROOVE G SURFACE
TRUE BORE H HOLE	FINISH FACE D SURFACE
TRUE BORE F HOLE	REAM F SURFACE

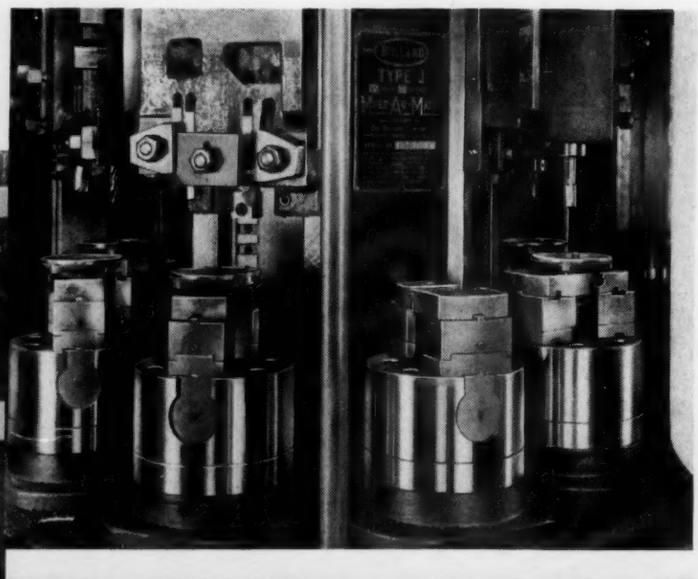
20 machining operations in 16 secs



COUNT 'EM

These are the facts on a motor cover job. There are 20 distinct operations from rough casting to finished cover. A "J-7" Mult-Au-Matic handles the job in exactly 16 seconds (plus a few seconds for indexing). Several of the operations involve removing up to 3/32" of stock.

Only Bullard Mult-Au-Matics offer the advantages of independent speeds, independent feeds and simultaneous operation, which makes such time possible. Most Mult-Au-Matics are available with 6 or 8 stations and arranged for single or double indexing as desired. If you are serious about cost reduction, ask for a study of your job by the Mult-Au-Matic Method.

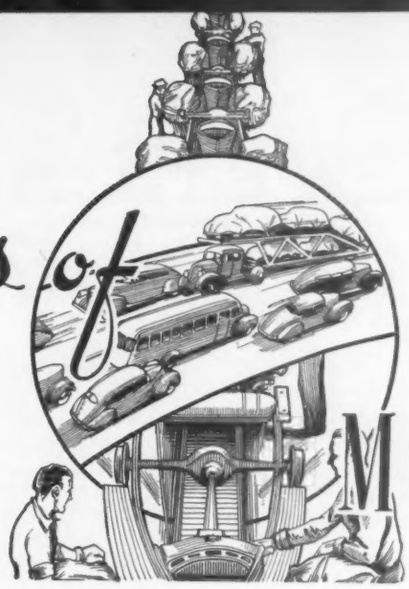


Start a finish o the job describ here

THE BULLARD COMPAN

BRIDGEPORT, CONNECTICUT

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Material appearing in this department is fully protected by copyright, and its use in any form whatsoever without permission is prohibited.

DETROIT

■ AUTOMOTIVE engineers seem to be in pretty general agreement that one of the most important developments yet to be perfected for widespread use on passenger cars is the hydraulic transmission. Fluid flywheel, fluid drive, hydraulic torque converter, hydraulic coupling or whatever you choose to call it, in its present conception is used in conjunction with the conventional gear train which requires shifting. The goal is some sort of device between engine and rear wheels which requires no manipulation by the driver other than pressure on the accelerator pedal. Whether it will be realized is dependent chiefly upon whether transmissions now designed and patented can be manufactured at a cost which car builders will O.K. for production.

The Chrysler fluid drive and the hydraulic transmission used on some busses built by Yellow Truck & Coach are two versions which have made their appearance so far. An interesting demonstration of the former was staged at the preview of new Chrysler models. The two housings with their impellers were made of glass so that action of the fluid could be observed as one half was propelled by an electric motor and gradually brought the other half up to full speed. By gripping the shaft on the driven side it was possible to feel the steady increase in torque through the unit.

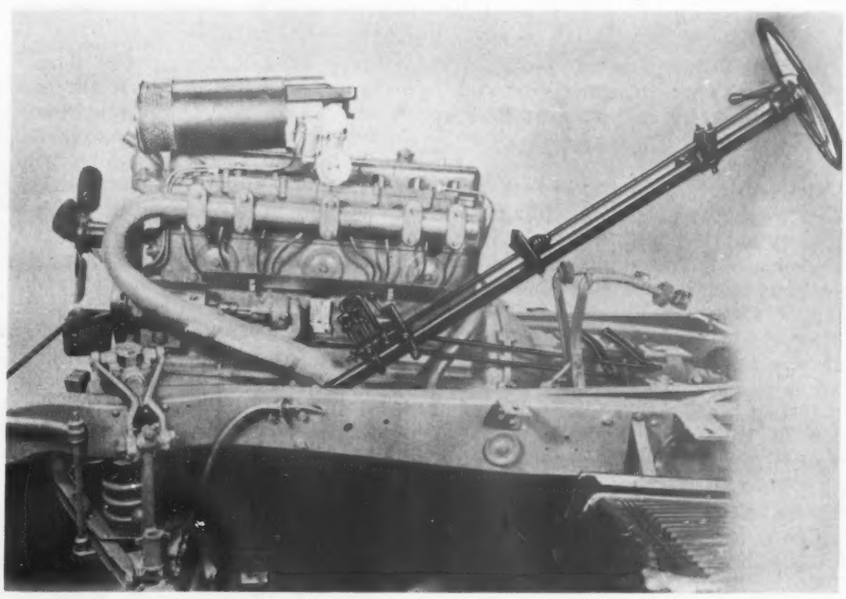
Chrysler engineers say that under all ordinary driving conditions the oil in the fluid drive becomes no hotter than the oil in the crankcase of an engine, natural circulation of air over the pressed steel housings keeping them from overheating. Slip in the unit naturally must be dissipated as heat, but at normal speeds on level road this slip is only 0.5-1.0 per cent.

It might be thought this loss of efficiency would increase gas consumption but engineers say the variation in fuel consumption between cars with and without fluid drives is less than the variation on the same car with different drivers. Furthermore, when a car equipped with fluid drive is started in traffic, in high gear, there is no racing of the engine in each gear as the car gains headway, hence the slight penalty in economy at normal speeds because of the slip is outweighed by the increased economy of operation in traffic, when 80 to 90 per cent of driving can be done in high gear.

The fluid drive used on Chrysler "Imperial" models holds two gallons and one pint of oil, being filled only 80 per cent to allow for expansion of the oil as it becomes heated. The oil will not sludge, it is said, because the fluid drive unit is sealed tightly from the outside air.

As to why a conventional transmission and clutch are provided in conjunction with the fluid drive, several reasons are stated: For reverse gear, to obtain maximum acceleration by going through gears when starting, for steep grades and getting out of chuck holes, and to provide a cruising gear for normal road speeds. Quick acceleration when passing is provided by the step-down feature of the transmission, and of

New Gear Shift for 1940 Nash



■ New type steering post gear shift is a feature of 1940 Nash models. A manual shift, it has no metallic connections, the two rods shown doing all the shifting. Engineers describe the mechanism as smooth and noiseless, easy and positive in operation

course a clutch is necessary to disengage the engine from the rear wheels when changing gears.

Some remarkable figures on volume of oil circulation through the fluid drive have been obtained in recent tests which indicate that with the car standing still, in gear with the clutch engaged and the throttle wide open there are nine tons of oil flowing through the unit every minute at engine speed of 850 r.p.m. Oil velocity under these conditions is about 21 feet per second.

The fluid drive operates on the same principle as the fluid flywheel device used for several years on certain foreign cars, notably the Daimler. It differs radically in construction, however, major structural parts being of stamped and forged steel welded together, while the fluid flywheel is made of aluminum castings of considerably thicker section which occasionally have been found to be porous and subject to cracks which might cause leakage.

Some engineers have wondered whether the high oil velocity in the unit might not bend the steel fins welded to the insides of the two housings, but tests show that with 22 fins on the driving member and 24 on the driven member (different numbers to avoid any harmonic vibration which might be set up due to periodic indexing of an equal number of fins in each member) the load is equally divided between them and does not exceed 29 pounds on any one fin.

Sees Future Importance

F. M. Zeder, Chrysler engineering chief, thinks the fluid drive in the next 15 years will become as important a contribution to motor car design as hydraulic brakes have become in the past 15 years. Naturally it will be subject to some modification from the present conception and it would appear logical eventually to dispense with transmission gears altogether.

The subject of hydraulics as applied to motor cars is an intensely interesting one and research into new phases is being pushed aggressively by such interests as Lockheed, Bendix, Delco, Wagner Electric and others in the hydraulic brake field. Despite the fact the auto industry has now subscribed 100 per cent to hydraulic brakes, there is no disposition to believe that brakes have reached the peak of their perfection. New ideas are continually being tested, patented and submitted to car builders for improving brake performance.

An example is an automatic adjuster which can be incorporated in conventional brake shoes so that as the linings wear the shoes are adjusted automatically to the proper clearance, ending the necessity for brake servicing. Another is a compound master cylinder which, through an ingenious arrangement of double pistons provides increasing brake pressure as the brake pedal is depressed. Another idea in hydraulic brakes, popular on European cars, is a master cylinder in which is located an auxiliary floating piston and suitable bypass ports to provide independent braking pressure to front and rear wheels. Thus, if a leak or some other defect should arise in one wheel cylinder, all four brakes would not be incapacitated. In certain respects this is similar to the system by Hudson which provides mechanical reserve brakes should any failure occur in the hydraulic equipment.

Lockheed Hydraulic Brake Co., affiliated with Bendix, is the father of hydraulic brakes and has worldwide patents on such brakes, receiving license or royalty fees from nearly every country in the world. Lockheed does no manufacturing, but maintains an extensive patent and legal personnel, with agents in all countries where it has patent controls. Lately considerable difficulty has been experienced in obtaining license fees from countries which have placed restrictions on export of money. In Germany, for instance, several hundred thousand dollars was due from licensees, but payment could be made only by arranging for a British licensee to accept German machinery in lieu of cash and then the British company discounting this and making payment to the American company. With war now an apparent fact, it likely will be doubly difficult to collect license fees, or even check on them.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	226,952	356,950
Feb.	383,900	202,597	317,517
March	519,022	238,447	389,489
April	553,231	237,929	354,263
May	540,377	210,174	313,214
June	521,153	189,402	324,235
July	456,909	150,450	218,478
7 mos.	3,373,778	1,455,951	2,274,146
Aug.	405,072	96,946	*99,000
Sept.	175,630	89,623	.....
Oct.	337,979	215,286	.....
Nov.	376,629	390,405	.....
Dec.	347,349	406,960	.....
Year	5,016,437	2,655,171	.....

*Estimated.

Estimated by *Ward's Reports*

Week ended:	1939	1938†
Aug 12	24,875	13,790
Aug. 19	12,955	23,940
Aug. 26	18,365	18,700
Sept. 2	25,240	22,165
Sept. 9	26,865	17,485

†Comparable week.

	Week Ended Sept. 9	Sept. 2
General Motors	7,850	7,200
Chrysler	10,425	7,025
Ford	.....	.....
All others	8,590	11,015

■ MORE than a little concern was being felt last week as a week-old strike at Bendix Products in South Bend threatened to cut off hydraulic brake assemblies from several of the major producers this plant is supplying. Bendix supplies some Ford, Packard and General Motors brake requirements and continuation of the labor trouble there might force suspension of assembly lines on 1940 models, if it has not already done so. One possibility seen was the temporary transfer of this business to other brake sources such as Delco or Wagner Electric. The difficulty at Bendix was reported to center on demands of the UAW-CIO for a closed shop, no question of wages being involved.

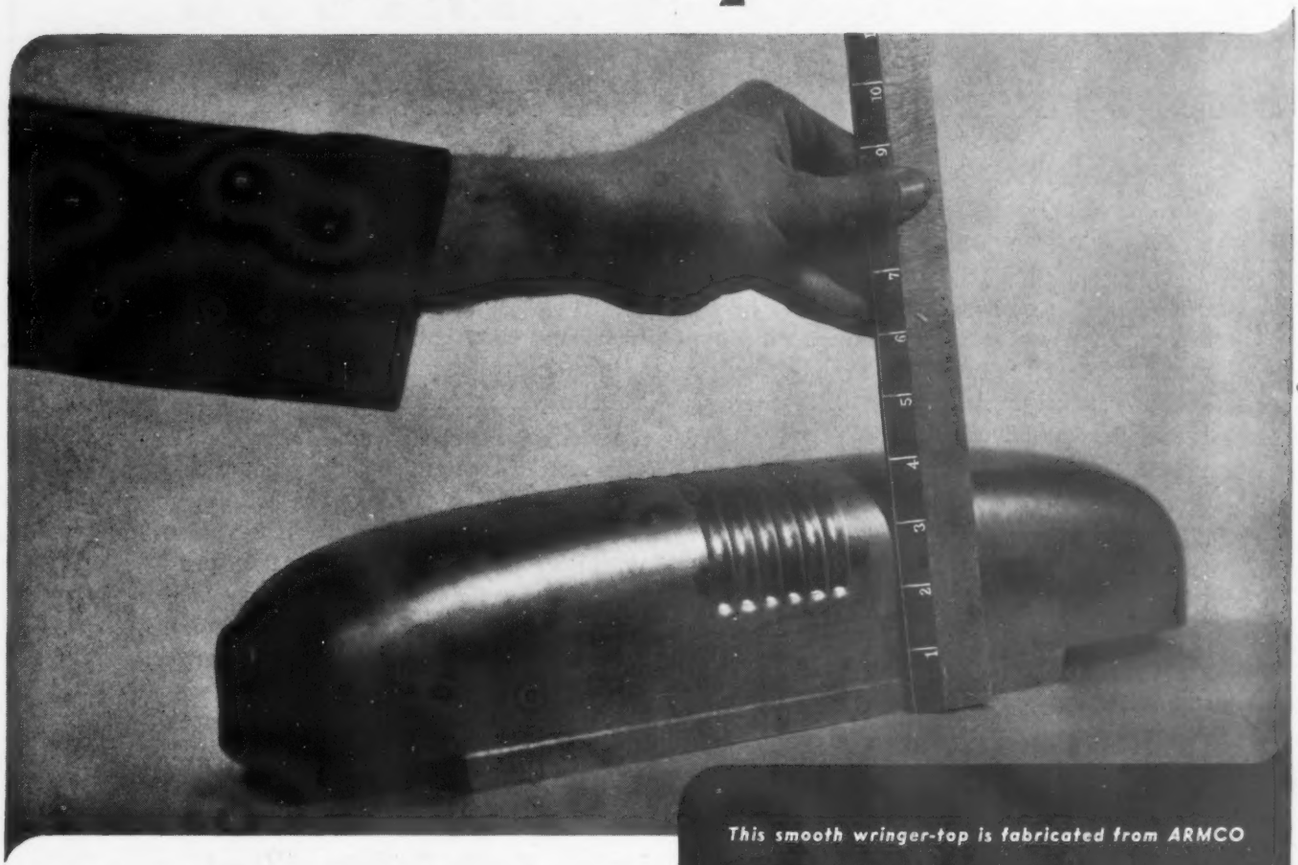
Labor Picture Clouded

It came hard on the heels of a similar strike at Warner Gear Co., Muncie, Ind., now settled, which forced curtailment of 1940 model manufacturing because of interruption in supplies of transmissions. Strikes at plants of Bohn Aluminum & Brass Corp. and Federal-Mogul Corp. here continue to drag out and fears are expressed they, too, may have repercussions on new model assemblies if not settled within the next week or ten days. Other parts plants are reportedly being lined up as targets for UAW-CIO strike attacks, further clouding an already murky labor picture.

Announcement of Buick prices last Thursday revealed reductions from $35 to $281 in the 60 and Limited series. The new 50 and 70 series, with the so-called "Torpedo" bodies, are priced $110 and $150 respectively higher than the same models in the 40 and 60 groups. In all, Buick lists 19 standard models ranging from $895 to $2199, delivered in Flint.

Machine for measuring and recording the relative roughness of roads has been developed by the Dow Chemical Co., Midland, Mich. Known as the Rufometer, it registers in b.p.m. or bumps per mile. It is mounted under the cowl and comprises a linkage from the lower independent suspension arm of the left front wheel to the instrument, a pen and pen arm, a numerical integrator, chart and chart drive mechanism. It will be used by the Dow company's road research department in promotion of Dowflake, a material for "consolidation" of road surfaces.

You can draw ZINCGRIP this way too



This smooth wringer-top is fabricated from ARMCO ZINCGRIP—with only one draw. It is 3⅞" deep, 3⅞" wide and 17¾" long. Holes are pierced after the drawing operation. There's no flaking or peeling.

• Here's a new kind of galvanized sheet that will stand severe forming and even moderate cold drawing without peeling or flaking of the coating.

This revolutionary zinc-coated sheet—known as ARMCO ZINCGRIP—will help solve your production problems, win *satisfied* customers and boost profits.

By using ARMCO ZINCGRIP you are assured *complete surface protection* for your galvanized products or equipment. Under proper working practice, corners and seams will be just as well protected, just as smooth as the flat parts. This way, ARMCO ZINCGRIP can do full justice to the design of your products.

Join the growing list of manufacturers who are getting such fine results with ARMCO ZINCGRIP. You can buy it in coils or sheets, with a choice of three base metals: durable ARMCO Ingot Iron, copper-bearing steel or open-hearth steel. A word from you about your possible applications will bring complete information. Ask for our free illustrated folder. The American Rolling Mill Co., 1271 Curtis St., Middletown, Ohio.

MAIL FOR FREE FOLDER

The American Rolling Mill Company
1271 Curtis Street, Middletown, Ohio

Send me your free folder on ARMCO ZINCGRIP
☐ Sheets ☐ Coils

We are interested in ZINCGRIP for_____

*Name*_____

*Firm*_____

*Address*_____

ARMCO ZINCGRIP SHEETS

GIVE FULL PROTECTION

Editorial

Steel Production as a Barometer

■ A LEADING Washington commentator recently, analyzing the factors on which administration economists based their belief that business over the next 90 days would improve, referred to the steel ingot production rate as the "bellwether" among business barometers.

This is no exaggeration. The rate at which the steel industry produces at any given time is a composite representing average activity at countless industrial establishments in the manufacture of myriads of products made wholly or in part of steel. And, due to the fact that steel must be produced to consumers' widely varying specifications, it is a true indicator of the level of industrial activity, for inventories of steel in the form of ingots never are built up to an extent that would distort the picture.

Steel Industry's Activity Has Effect On Nearly All Other Markets

The steel production rate, therefore, is a valuable indicator throughout all industry, and its trend reflects the trend in business volume generally. Its trend is particularly interesting to the many industries that sell all or part of their product to the steel industry. These are highly diversified. Some years back the purchasing agent of an important steel company had a standing offer to pay one of his friends $5 whenever the latter could think of a product the steel company did not buy. The friend never was able to collect because this steel company in addition to its steelmaking operations, from ore to finished rolled product, operates fabricating plants, restaurants, hospitals, ships, recreation rooms and other facilities.

The size of these purchases, even items that might be regarded as negligible, often is astounding. For instance, the American Iron and Steel institute recently reported (STEEL of Aug. 28, p. 21) that the steel industry uses nearly four million lead pencils and 2500 gallons of ink in doing the paperwork required in the making and selling of steel.

In view of the size of the industry, and the scattered location of steel plants geographically, the accuracy of the estimates of the weekly production rate is surprising. For instance, STEEL'S weekly production rate estimates for April, May and June of this year averaged 51.26, 47.89 and 53.42 per cent respectively. Actual production in those months, as subsequently reported by the American Iron and Steel institute, was at the rates of 50.78, 48.32 and 53.35 per cent of capacity.

Accurate Weekly Estimates of Great Value in Judging Trends

STEEL has received a number of suggestions of late as to how the weekly production index might be interpreted so as to provide still more useful information. Unfortunately such interpretations do not appear compatible with the need for strict accuracy. This objection applies to one suggestion, for example, that the publication of the operating rate each week be accompanied by a calculation as to the annual rate at which the steel industry is making or losing money at that operating rate. The difficulties in the way of an accurate index of this kind are self-evident.

Statistics are desirable only when they are accurate. Undoubtedly the existing statistical information will be supplemented with additions from time to time. In the meantime, the weekly estimate on steel production is a highly accurate, dependable barometer of unquestioned value to students of business trends.

The BUSINESS TREND

Index of Industrial Activity Records Moderate Gain

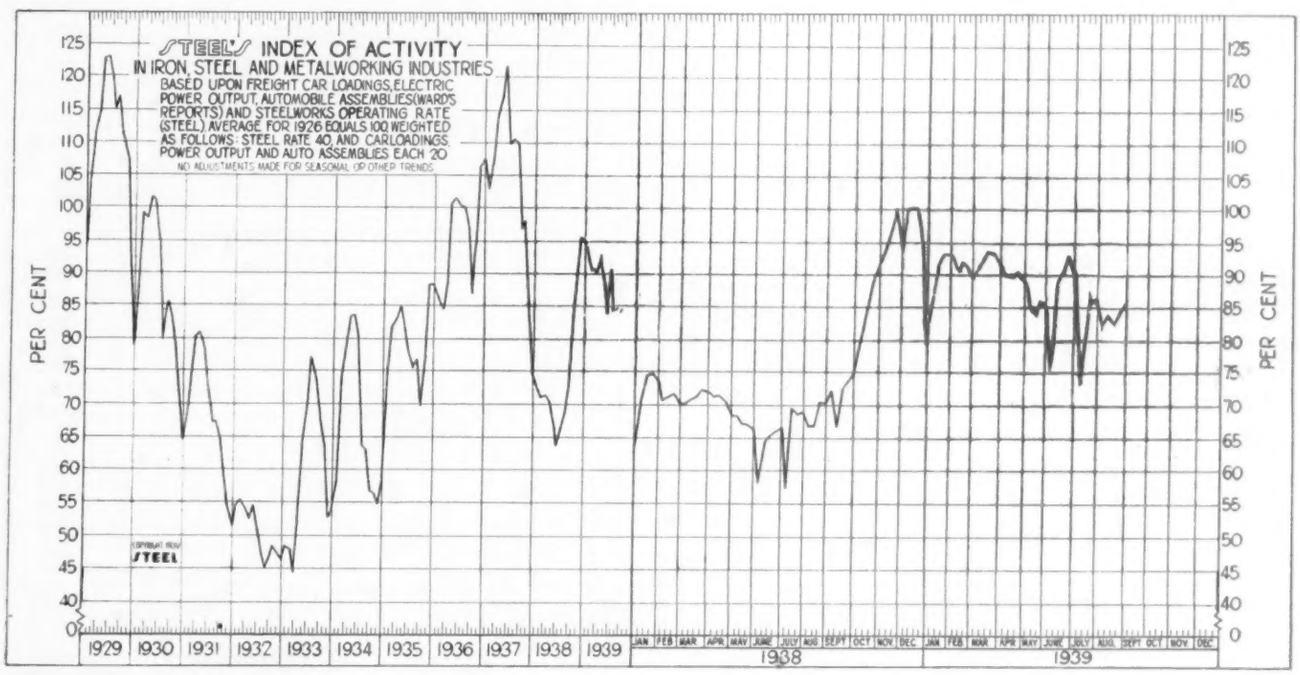
■ Records of industrial activity throughout August served to impart a positive tone to the upward tendency which got underway early in June. Steelmaking operations last month extended the gains recorded during June and July to touch a new high for the year. Other important business indicators such as revenue freight carloadings and electric power consumption recorded encouraging gains, the former reaching a new 1939 high and the latter setting an all-time peak. Automobile production was one of the few important business indicators to lose ground during August, but this was entirely seasonal as producers completed 1939 schedules.

The fact that industrial activity was able to expand during August in the face of impending European war was particularly encouraging. Now that armed conflict is a reality there are good indications that increased demand for raw material and finished goods will stimulate business in general.

Reflecting further improvement recorded by most business indicators during the week ended Sept. 2, STEEL's index advanced 2.9 points to 86.3. This compares with 72.3 in the comparable week last year.

Steelmaking operations increased a half point to touch 64 per cent in the week ended Sept. 2. This is the highest rate recorded since Oct. 9, 1937. Holiday interruptions last week resulted in a temporary decline in the national steel rate, but a rebound to still higher levels is indicated throughout September.

As anticipated, automobile output recorded only a


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100 WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity gained 2.9 points to 86.3 in the week ended Sept. 2:

Week ending	1939	1938
June 17	90.9	65.2
June 24	93.0	66.0
July 1	91.0	66.5
July 8	73.4	57.1
July 15	87.8	69.9
July 22	86.0	68.7
July 29	86.8	69.0
Aug. 5	83.5	66.9
Aug. 12	83.9	66.9
Aug. 19	82.2	70.5
Aug. 26	83.4	70.3
Sept. 2	86.3†	72.3

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	....	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

†Preliminary.

small increase during the week of Sept. 2, as two large volume producers were still down preparatory to starting new model production. Ford started assemblies on the 1940 models last week but Chevrolet will probably not get underway until Oct. 1. Automobile assemblies in the week ended Sept. 2 totaled 25,240 units, against 17,465 the previous week and 22,165 in the comparable week a year ago.

Early indications point to a sharp increase in revenue freight carloadings for the week ended Sept. 2, to approximately the 720,000 cars-per-week level. If this estimate proves accurate, freight traffic in that week not only touched a new 1939 high but also exceeded any weekly total since Oct. 15, 1938.

Electric power output recorded a small increase in the week ended Sept. 2 to 2,357,203,000 kilowatt-hours. This compares with 2,354,750,000 kilowatt-hours in the preceding week, and remains well above the total power consumed in the comparable week a year ago.

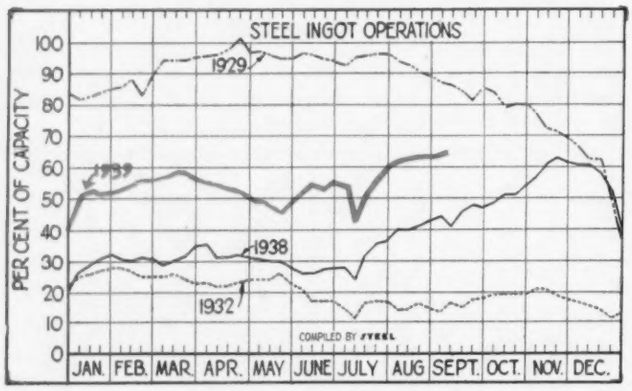
AUGUST PIG IRON OUTPUT UP SHARPLY

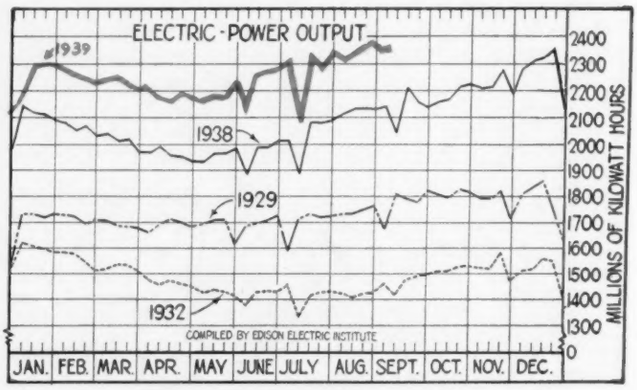
Average daily coke pig iron production during August totaled 86,211 tons, compared with 76,001 in July and 48,242 in August, 1938. Production last month of 2,672,542 tons was the highest since October, 1937, and was 13.5 per cent over the July total. Relating production to capacity, operations in August averaged 62.5 per cent, against 55.0 for July and 34.8 per cent recorded in August a year ago. Total output for the first eight months this year was 17,549,709 tons, or 65 per cent over the 10,639,688 tons produced in the like 1938 period.

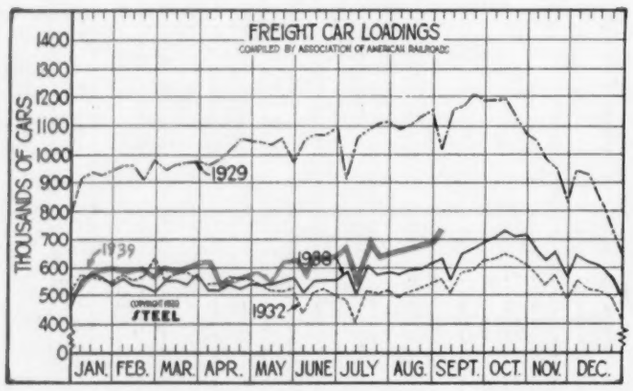
FOREIGN TRADE LOWER IN JULY

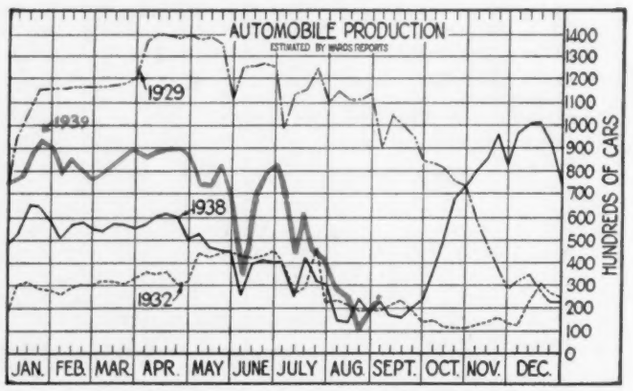
A normal seasonal decline in foreign trade developed during July with both imports and exports receding slightly from the June totals. Exports in July aggregated $229,628,000 and imports $168,925,000, which left an excess of exports of $60,703,000 for the month. In June shipments of $236,059,000 exceeded imports of $178,921,000, by $57,138,000 and in July, 1938, an export balance of $86,726,000 resulted from shipments of $227,535,000 and receipts of $140,809,000.

Iron and steel foreign trade followed the general trend. Exports during July of 513,664 were down from the 588,856 tons exported in June, while imports receded from the 32,587 tons reported in June to 30,851 tons in July.



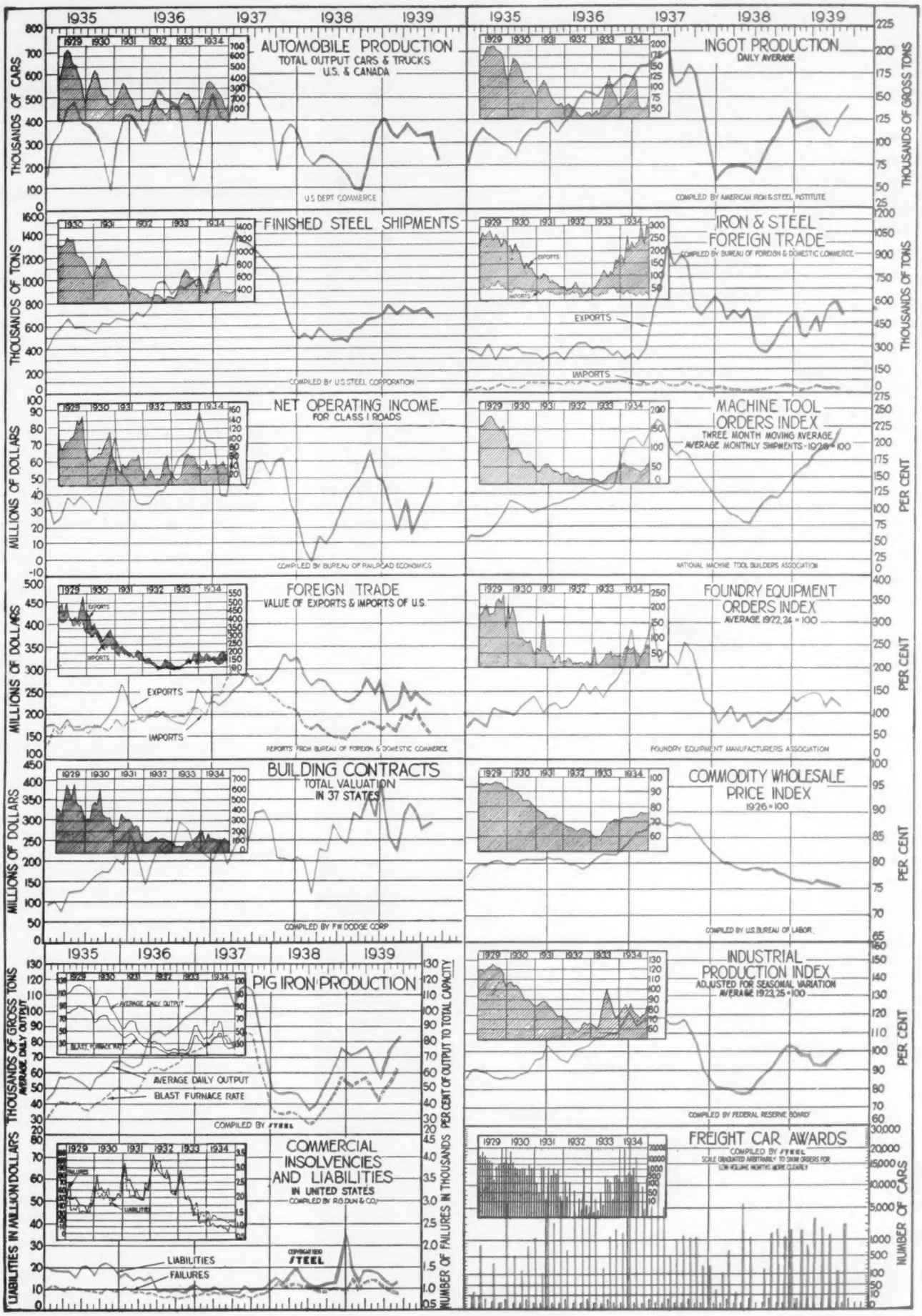


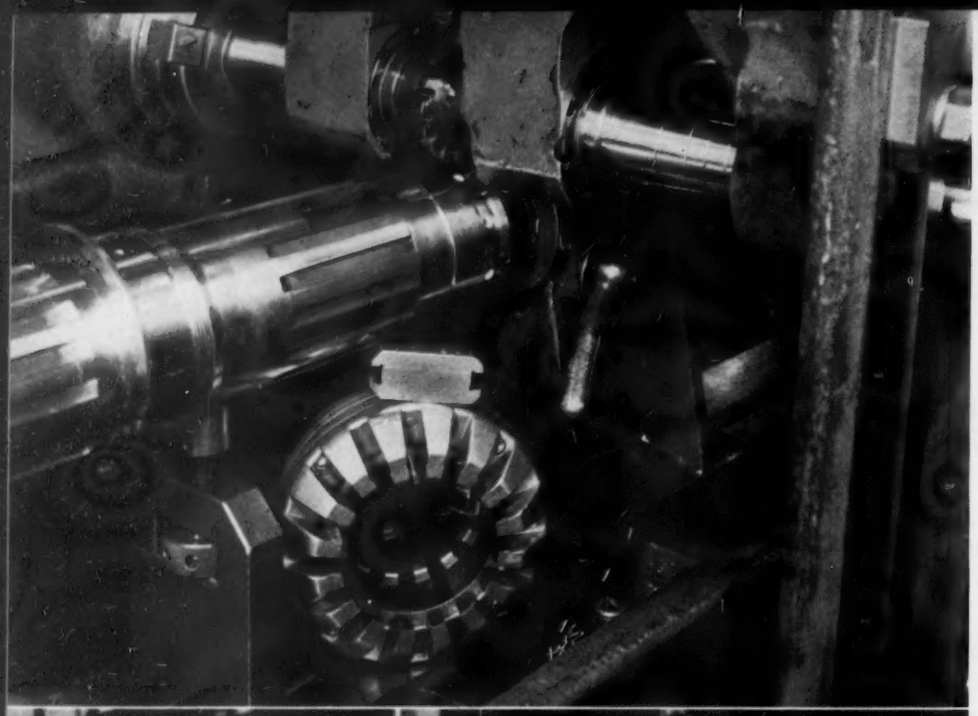


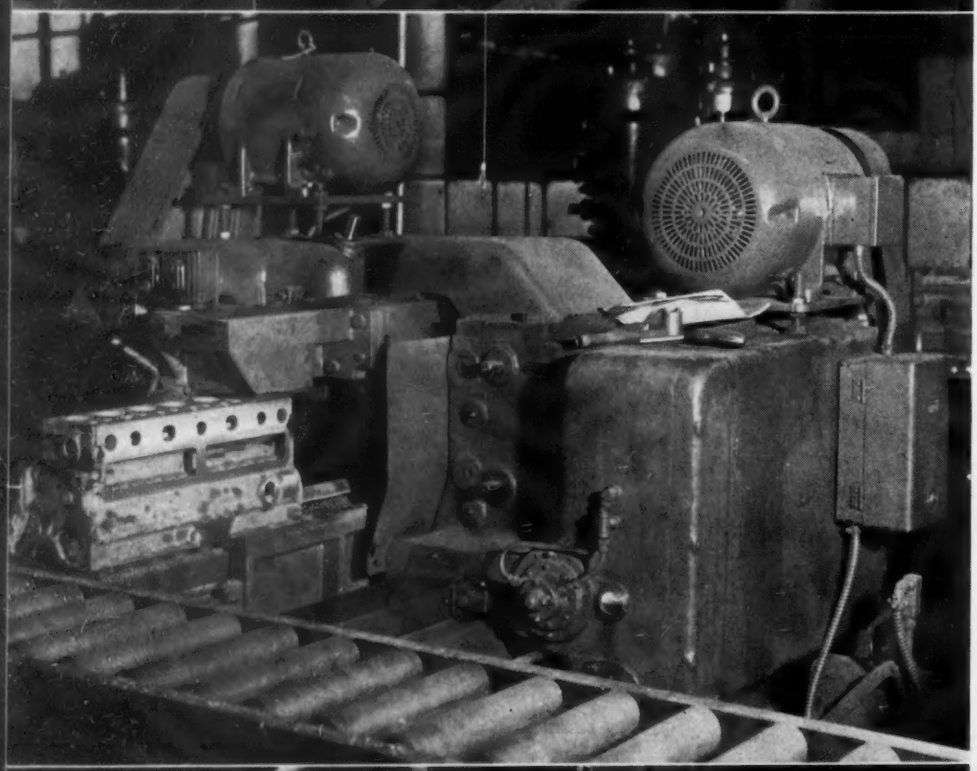


Week ending	Steelworks Operating Rate Per Cent 1939	1938	1932	1929	Electric Power Output Million KWH 1939	1938	1932	Freight Car Loadings Thousands of Cars 1929	1939	1938	1932	1929	Weekly Auto Output 1939	1938	1932	1929
May 27	48.0	28.5	23.0	95.0	2,205	1,973	1,425	1,705	628	562	521	1,061	67,740	45,120	45,121	136,032
June 3	52.0	25.5	21.0	95.0	2,114	1,879	1,381	1,615	568	503	447	972	32,445	26,980	44,116	111,372
June 10	53.5	25.5	17.0	96.5	2,257	1,992	1,435	1,690	635	554	502	1,055	65,265	40,175	43,491	125,307
June 17	52.5	27.0	17.0	96.0	2,265	1,991	1,441	1,699	638	556	518	1,069	78,305	41,790	44,121	126,125
June 24	54.5	28.0	17.0	94.0	2,285	2,019	1,440	1,723	643	559	499	1,096	81,070	40,918	45,110	125,736
July 1	54.0	28.0	14.5	93.0	2,300	2,015	1,456	1,592	666	559	480	909	70,663	40,945	40,291	98,746
July 8	42.0	24.0	12.0	95.0	2,078	1,881	1,341	1,712	559	501	416	1,065	42,784	25,375	26,560	113,586
July 15	50.5	32.0	15.5	95.5	2,234	2,084	1,415	1,727	674	602	504	1,079	61,610	42,010	29,870	115,075
July 22	56.5	36.0	16.5	96.0	2,295	2,085	1,433	1,723	657	581	502	1,101	47,420	32,070	46,375	123,512
July 29	60.0	37.0	16.5	96.0	2,342	2,094	1,440	1,725	660	589	511	1,104	40,595	30,390	22,461	110,163
Aug. 5	60.0	40.0	14.5	94.0	2,325	2,116	1,426	1,730	661	584	497	1,091	28,250	14,771	23,591	114,364
Aug. 12	62.0	40.0	14.5	93.0	2,333	2,134	1,415	1,733	661	589	512	1,100	24,875	13,790	21,162	111,939
Aug. 19	63.5	41.5	15.5	90.0	2,368	2,139	1,431	1,750	674	598	518	1,136	12,955	23,940	19,568	111,902
Aug. 26	63.5	43.5	14.5	89.0	2,355	2,134	1,436	1,762	689	621	538	1,160	18,365	18,700	19,896	113,316
Sept. 2	64.0	44.5	13.5	87.5	2,357	2,149	1,464	1,675	720†	648	561	1,017	25,240	22,165	19,561	90,913

†Preliminary.


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
THOUSANDS OF CARS
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
THOUSANDS OF GROSS TONS
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
THOUSANDS OF TONS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
MILLIONS OF DOLLARS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
PER CENT
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1972,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
THOUSANDS OF GROSS TONS
PER CENT OF OUTPUT TO TOTAL CAPACITY
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS





For Machine T

■ MILLING, which appeared originally in the form of what might be described as "mechanized filing," was one of the first metal machining operations to be highly developed. This was due primarily to its fundamental importance in the manufacture of firearms, an art which had profound influence in many directions throughout the history of machine tool building.

While the famous inventor Eli Whitney generally is credited with the fundamental development of the milling machine, it is only fair to state that certain European gunsmiths—notably the French—were using them long before Whitney's time. There is some possibility that Eli Whitney knew of these French machines through Thomas Jefferson, who became keenly interested in the possibilities of interchangeable manufacture of firearms as early as 1785 when he was minister to France. Jefferson was a staunch supporter of Whitney in the latter's struggles to perfect interchangeable manufacture of muskets for the United States government.

Be that as it may, it certainly is true that Eli Whitney was the father of the milling machine as it developed in America. The ancestry of several well known milling machines today can be traced back indirectly

Fig. 1. (Top)—Brown & Sharpe manufacturing type machine "climb milling" splines in Pratt & Whitney aircraft engine propeller shaft

Fig. 2. (Center)—Special Ingersoll multiple head machine designed to operate simultaneously on both sides of Studebaker Champion cylinder blocks

Fig. 3. (Bottom)—Cincinnati duplex hydromatic miller machining both faces of both ends of the connecting rod of a large diesel engine

Tool Progress Take a Look at Milling!

By GUY HUBBARD
Machine Tool Editor

to the small "manufacturing milling machine" which Whitney introduced and used successfully about 1818.

It is interesting to note that early milling cutters—including Whitney's—actually were files, rotary files. They were steel disks with typical chiselcut file teeth around the periphery.

From the Whitney miller came the Howe miller, of which as the Lincoln milling machine of Pratt & Whitney and the manufacturing miller of Brown & Sharpe, untold thousands were sold both here and abroad over a period of 80 years or so. The influence of American milling machines of this and many other types has been tremendous all over the world where every and any sort of metal working is conducted under manufacturing conditions. Today some of the American milling machine companies rank not only as the largest—but also among the most advanced in methods—of the machine tool builders of the world.

The profitable application of milling machines spread rapidly from firearms to sewing machine manufacture and thence into all lines of manufacture of metal parts. Originally confined to small work which could be handled in small, simple machines, the possibilities of milling later were greatly enlarged by the introduction of universal; heavy duty; planer type; and a wide variety of special types of milling machines too numerous to mention.

Cutters Highly Developed

Developments in cutters have had even more effect on the design and application of milling machines then has been the case with other machine tools. This is true not only of the material used in the cutters but also in the design of their cutting teeth—to which a great deal of highly scientific attention has been paid within recent years. It is a far cry from the small, fine tooth cutters of 50 years ago which under a dribble of lard oil chattered and slowly gnawed their way through small, easily machined parts, and the big, coarse tooth cutters which today—under a deluge of cutting compound—swiftly and inexorably wade deeply through tough alloys.

It likewise is a far cry from the milling machine of 50 years ago to that of today. As one commentator said of one of the old machines now on exhibition in an industrial museum: "Obviously it was used in a sewing machine plant. It looks like a sewing machine!"

Now A Powerful Tool

In contrast to the spidery looking, belt driven machines of those days, modern milling machines are among the heaviest, most rugged and most powerful machine tools. On account of the nature of their cutting action and the amount of metal removed at one pass, there can be no compromise with rigidity of frames, tables and slides, strength of spindles and shafts and smoothness and power of both drive and feed. It is not at all uncommon to find milling machines today with 25 or even 50-horsepower drive motors—whose predecessors of a quarter of a century ago would have struggled along somehow with 5 or 10 horsepower.

When the amount of metal removed per minute by the old machines is compared with that removed by the latest models, the reason for the tremendous increase in power is apparent. Incidently, power today is one of the cheapest commodities used in metalworking plants, and when it is used effectively—as it is in all modern milling machines — investment in power pays very large returns.

As has already been implied in this article, the subject of milling machines and their cutters has grown to be extremely broad. It is expected that in future articles various phases of these related subjects will be covered in some detail. Just to give an idea of the scope and importance of milling in the aircraft, automotive and diesel engine industries—three important modern industries — some milling machine photographs taken "right on the job" in well known plants are presented herewith.

The increasing use of integral multiple splines in aircraft and automotive work, due to the solid support and unquestioned strength of such splines, involves milling of tough material to close limits of accuracy. Take for example the setup depicted in Fig. 1, which shows the milling of splines on the propeller shaft of a Pratt & Whitney aircraft engine in a Brown & Sharpe manufacturing milling machine.

"Climb Cutting"

Careful examination of this photograph will reveal that the technique known as "climb cutting" is being used. This means that instead of revolving upward as it approaches the work (the conventional method) the cutter in this case is revolving downward. This method of milling, which among other advantages insures that the teeth instantly bite into the solid metal, at the same time puts demand on the machine which old models could not "take." Absolute rigidity and absence of chatter or backlash are essential. Note that the work is supported from below by a steadying jack. The gages shown in the foreground are used to check width and spacing of the splines and their straightness and concentricity with the body of the shaft.

Shown in Fig. 2 is a typical example of heavy duty production in

(Please turn to Page 66)

Stainless Steel

Enters The Construction Field

New, easily fabricated material combines advantages of noncorrodible stainless steel surface with the load carrying ability of a sturdy mineral composition backing material. Forms economical "lumber" for many indoor and outdoor applications

■ WITH THE advent of a new stainless steel lumber recently developed and placed in production by Allegheny Ludlum Steel Corp., Pittsburgh, through its Ludlite division, in Watervliet, N. Y., it seems likely that a broad new market is destined to unfold for stainless steel.

In the bare 15 years since its commercial inception, stainless steel has rushed head-long to popular acceptance, with the above company a principal factor in its development. Thus reference to unfolding of a new market seems almost an anti-climax as stainless has had little trouble in finding extensive applications to date.

Has Many Desirable Qualities

The qualities in the metal responsible for this rush of popularity are well known. In some fields its great strength with lightness has been the introducing medium. In others, its resistance to elemental or chemical attack. In still others, its heat endurance. As a matter of fact, stainless steel offers so many advantages there has been little to detract from its upward surge.

Only factors tending to hold it back are these: Its relatively high cost, and necessity for fabrication by more than ordinarily skilled workmen, in many cases using tools and methods specially developed for the job. Of course in such fields as dairies, food plants, hospitals, etc., other factors such as its great durability and the ease of maintaining the surface in a sanitary condition greatly out-weighed any retarding factors on the cost or fabrication side.

However, even these factors are largely eliminated in Allegheny Ludlum's new stainless steel lumber panels, called Ludlite Bord. The product consists essentially of thin sheets of the well-known Allegheny Metal (18-8 stainless steel), permanently bonded to an inert mineral backing material to form strong, rigid panels of convenient building size.

The outer surface retains all the normal beauty and utility of stainless steel, since the properties of corrosion and wear resistance of stainless are just as pronounced in thin sheets as they are in heavier gage material. The high cost of the stainless metal no longer is a factor since the thin metal surface permits a given weight of stainless steel to be spread over a tremendously increased area.

The mineral backing material, the successful outcome of long and arduous research, is relatively inexpensive. It is more suitable for this application than any other type of material studied or used for a composite product. It consists of asbestos fibres, Bentonite (volcanic clay), Portland cement and calcined magnesite. This material is processed under great pressure and bonded to the stainless steel facing by means of a special pressure-cementing process to form semirigid and extremely flat lumber panels.

The Allegheny Metal 18-8 stainless strip is hot rolled and then cold reduced to 0.0095-inch, the thickness at which it is applied to the mineral backing.

The resultant product combines many desirable qualities. Ludlite Bord is fireproof and fully weather-resistant. Coefficient of expansion of backing material closely approximates that of the stainless steel so no distortion of the product occurs under any ordinary temperature. Also the permanent and highly reflective steel facing reflects about 90 per cent of all heat rays directed at it. In addition, backing material has high thermal insulating value.

Immune To High Humidity

While the backing material will absorb moisture, such absorption does not cause the product to warp or distort. Thus it is immune to high humidity and is equally suitable for indoors or outside applications. Under all ordinary conditions of service, it is entirely free from warping and surface distortion.

Ludlite Bord is acoustically a dead material, absorbing sound, and so has excellent acoustic properties.

The surface has excellent resistance to denting or marring by impact.

Ludlite Bord is made in two standard size panels, 2 x 4 feet and 2 x 8 feet. The 4-foot length is especially suitable for wainscoting and the 8-foot length for wall surfacing.

It comes in two standard thicknesses: ⅛ and ¼-inch, weighing 1.54

"Lumber"

and 2.5 pounds per square foot, respectively. The ⅛-inch panel is flexible enough to be bent 180 degrees to suit the requirements of a job, without losing any of its flatness. The ¼-inch panel is extremely rigid

Top shows how easily Ludlite Bord is erected as a wainscoting. With Bord held to wall by strip, molding trim is slipped in place. Just below, an office lobby with wainscoting of ¼-inch rigid Bord. Vertical molding is Allegheny Metal snap-on. Horizontal is black finish Newtile, fastened to wall with stainless screws. Post at left covered with Ludlite Flex. At right, sink, table top and splash board are of rigid Ludlite, the square tile effect being obtained with Ludlite Flex, cemented in place

Store front of modern appearance easily made with low material and erection costs

and possesses high load-bearing strength.

The material also is available in two finishes: standard No. 4 (satin) and pebbled (embossed face). During manufacture, the satin-finish panel is given a special film coating to protect the surface finish. Coating is readily removed with a damp sponge on the job. The pebbled surface does not show dents or scratches and is used where surface wear of an unusually abrasive nature may be encountered. It also possesses excellent light-reflective qualities making it desirable for such applications as signs, displays, storefront decoration, etc.

A principal advantage in favor of Ludlite Bord is its remarkable ease of fabrication. This new construction material is definitely **every man's** stainless steel. It may be sawed to shape with an ordinary hand saw. It may be sheared as easily as plain sheet metal and drilled as readily as ordinary hard wood. For some purposes it may be stamped. It can be nailed or screwed in place. Joints are soldered easily. If the work is done with care, it also can be welded.

Installation Cost Is Low

With fabrication so easy, installation cost as well as first cost is materially reduced. Ludlite Bord is definitely a stainless steel that any ordinary workman can install. It requires no special knowledge and only ordinary tools such as found in any carpenter's chest. Sawing this product does not cause excessive wear of saw teeth as elements in the backing material provide lubrication.

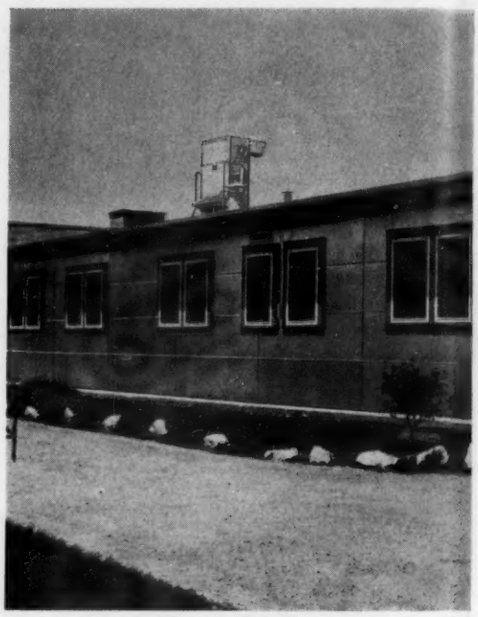
These are important considerations that construction and fabricating fields are bound to look upon with extreme favor. In fact it is entirely possible for an ordinary householder to buy panels of Ludlite Bord and fashion for himself a sink top, closet lining, fireplace front, or make other similar applications around his home.

In the construction field, Ludlite Bord has the great advantage of being a self-contained and complete unit; that is, the contractor is able to secure a siding and a finished surface in one operation, no further painting, waxing or other surface work being necessary. In uniform pieces of identical size, the panels require no prefabrication of any sort. Thus the product is equally adaptable to new work or modernization jobs, since it can either be used by itself or applied over any old surface, no matter how rough or uneven, without losing its characteristic flatness.

A complete variety of stainless steel moldings, both snap-on and plain type, have been developed by Allegheny Ludlum for use with the product on flat surfaces, corners or edges. The stainless steel lumber may be nailed direct to the studs or a special molding nailed to the studs and the stainless panels slipped into place, completely covering the nails. In other cases the standard sections can be cut and fitted to the requirements of the job as with ordinary lumber.

Ludlite Bord follows closely on the heels of the flexible form of Ludlite (Ludlite Flex), announced several years ago and now in wide use throughout the country. The flexible form has the same thin stainless steel facing but on an inert and weather-resistant backing much lighter in section than Ludlite Bord backing. Made in sheets, ribbons or tile, Ludlite Flex may be cut with ordinary tinsmith's shears, bent or shaped to fit any type of surface, and applied with special Ludlite adhesive as readily as any linoleum. Essential difference between it and the new lumber product is that the flexible form is purely a surfacing material, whereas the rigid panels may be used as self-contained building units.

On that basis, Ludlite Bord has



Farmers Locker Cold Storage Plant, Oxford, Pa., surfaced on outside with the new rigid Bord

distinct possibilities in house construction, both low cost and otherwise, a field in which the flexible form already is well established for such use as bathroom and kitchen wainscoting. In the hospital field, ceilings of operating rooms, etc., may be sealed completely by joining the panel sections with a high tin content solder for stainless steel work.

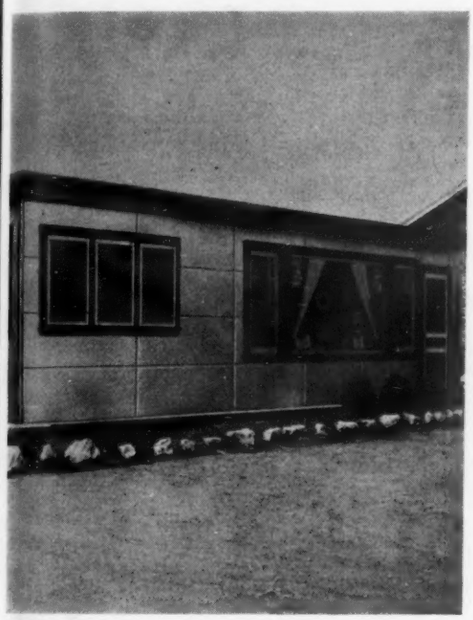
Wherever sanitation is involved, as in the dairy, bakery, restaurant and general food fields where problems of cleaning and humidity have always been troublesome, the new material is expected to meet wide acceptance.

For decorative purposes, the permanently lustrous surface of the panels is sufficient inducement in itself. However, it also is amenable to added decorative effects. The surface may be etched or buffed into pleasing designs if desired. Special paints and lacquers also have been

developed which are satisfactory for use on stainless.

On wall surfaces the panels may be varied with other materials. In offices, as an example, it is a simple matter to set 4-foot high panels in place as a wainscoting with a narrow divider or snap-on molding between the panels and a border of Bakelite, colored tile or building glass at top or bottom. If inadvisable to use molding between the panels, mastic may be substituted. Where a stainless steel wainscoting might not be desired, a strip 6 or 8 inches wide makes an attractive base board.

Doors may be made with a wood



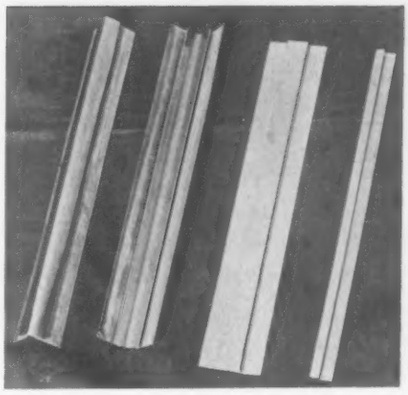
frame covered with Ludlite Bord to give the massive appearance of solid stainless steel. Building trim can be built up by using a combination of stainless lumber and molding, joined by soldering or weldng. Unattractive columns may be faced with the paneling. One manufacturer is using panels joined back to back as a sanitary partition, which already has suggested the possibility to Allegheny Ludlum of manufacturing the Bord with a stainless surface on both sides.

The product is being specified for shower stalls in the first group of buildings for Boulder Dam National Park. The stainless steel panels will be used for the walls, and flexible Ludlite for the pan with the sides brought up about 8 inches. All joints will be soldered. A maker of butter substitutes has just completed a cooling chamber for margarine using the stainless steel panels at 1/15 of the usual cost. This is followed by application of molding around edges.

Outside the building field, many uses for this stainless steel lumber are already suggested or in the development stage. For the sign industry, the new material presents an attractive background for colored lettering. Also it is readily processed by silk screening or lithographing. In sign work its high light-reflecting quality is important, along with the impervious nature of the surface.

In the railroad field, stainless lumber has possibilities in car construction. Interiors of refrigerator cars, for instance, could be made fully moisture and air-tight, as well as sanitary and easy to clean. Stainless may be washed down as readily as glass. Other popular applications include its use as light-weight paneling for new or rebuilt passenger cars, or as decorative trim or complete wall interiors for dining car kitchens. In fact the exteriors of both freight and passenger cars are regarded as well within the realm of possibility, since Ludlite Bord provides considerable structural support on its own account and would never require surface finishing.

Other possibilities are offered in the truck body field, where the weather-resistant and sound insulating stainless panels would serve well for both exteriors and interiors. The product is already making considerable progress in this field. A large New York restaurant chain is in the process of developing the Bord for lining interiors of its commissary trucks. Another pending application of similar nature is in the elevator field where it is employed in cab walls. Here, in addition to an easily cleaned and permanently attractive surface, it is possible also to effect considerable weight reduction.

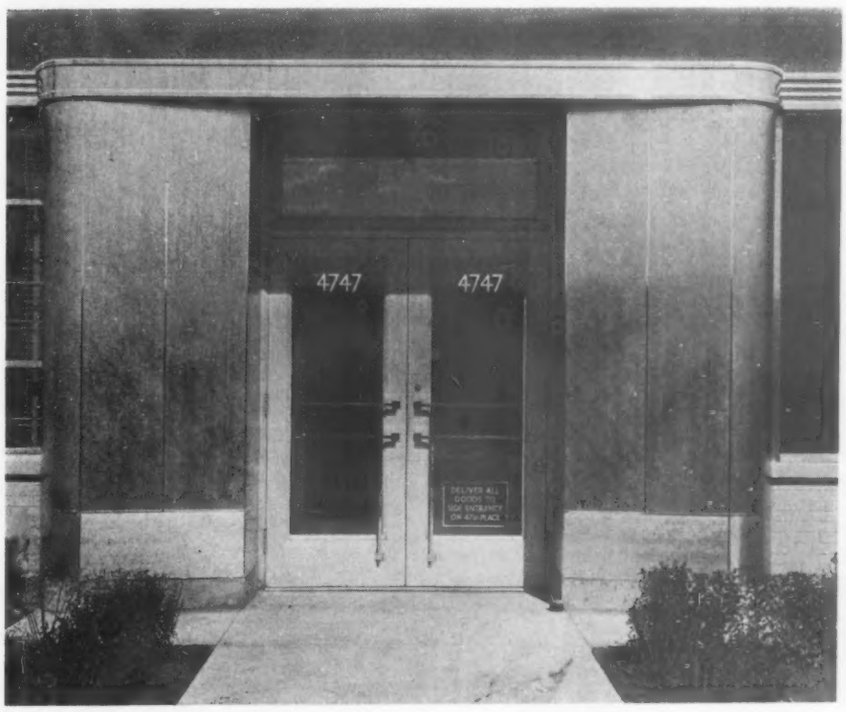


Typical molding strips of stainless steel for use with the stainless "lumber"

While the stainless Bord may not find a large outlet in the container field, it does present possibilities for pans and similar equipment where no great temperatures are involved. In sugar refineries, settling pans of satisfactory nature and considerably reduced cost have been made by simply soldering panel sections together.

Obviously the high spots have

(*Please turn to Page* 66)



Ornamental entrance. Canopy facia consists of wood frame extending 11½ inches from face brick, covered on top and bottom with stainless. Soffit and curved face covered with Ludlite Flex, straight face with Ludlite Bord. Side columns are similarly made

Combustion Control

New method permits automatic firing and air-ratio control of either or both of two fuels. Eliminates losses from operating coke plants to supply gas for finishing operations. Control permits instant changeover from gas to oil or tar

By M. J. BOHO
Engineer
Hagan Corp.
Pittsburgh

■ DURING the past year, operating schedules in many steel plants have been quite uncertain. As a result, those plants which used coke oven gas on their finishing operations find it necessary at times to operate their coke plants to supply the necessary gas for their finishing operations and to store coke. Such a method of operation results in huge losses, and it is desirable in many instances to set aside certain furnaces in a plant to act as balance wheels on the coke gas system. If plenty of gas is available, these furnaces are of course operated as gas-fired units. However, if for some reason gas pressure falls, a suitable number of furnaces are fired with oil and the load on the coke gas system is correspondingly reduced. The control arrangement described here permits instant changeover from one fuel to the other with no changes in the control adjustment required—the only operation being that of turning on the desired fuel.

Handles Gas Or Liquid Fuels

The system developed to meet this need maintains the benefits of automatic fuel-air ratio control on furnaces which are called upon to burn gas, oil or tar at different times in accordance with fuel availability, heating requirements, etc. The general arrangement is revealed in Fig. 1. The system as shown is applicable to either gas or liquid fuel firing, and will permit accurate maintenance of fuel-air ratio when gas is being used and also when oil is being burned. This system is applicable to either fuel, but not both together. If a problem should arise where both fuels are fired at the same time, a simple totalizing device, not shown, is added to the equipment.

How It Works

When firing oil, for example, the system operates as follows: An oil-flow relay, mounted at the panel board and equipped with a suitable indicator, is adjusted by the operator for the desired rate of oil flow to the furnace. An oil-flow measuring element meters the rate of flow and generates an impulse, which is a measure of oil flow. This impulse is sent to a balancing relay where it opposes the manually set up impulse from the oil-flow relay. As a result of the balance between the desired rate of flow and the actual rate of flow, a third impulse is generated by the balancing relay and impressed on the diaphragm of an oil-control valve. If the measured rate of flow corresponds to the desired rate as set up by the oil-flow relay, the oil-control valve remains statdionary. However, when the rate of firing is readjusted or when changes in resistance through the burner or changes in the pressure of the oil supply cause the actual measured flow to depart from the desired rate of flow, then the impulse to the oil-control valve is changed the necessary amount and in the right direction to restore oil flow to the desired value.

Ratio Regulator Controls Air

The impulse pressure generated by the oil-flow measuring element is impressed on a loading bellows attached to the air-fuel ratio regulator, calling for the desired amount of combustion air. The air-fuel ratio regulator controls this air by operating a suitable damper in the forced draft system until the pressure drop across the air measuring orifice is in balance with the loading

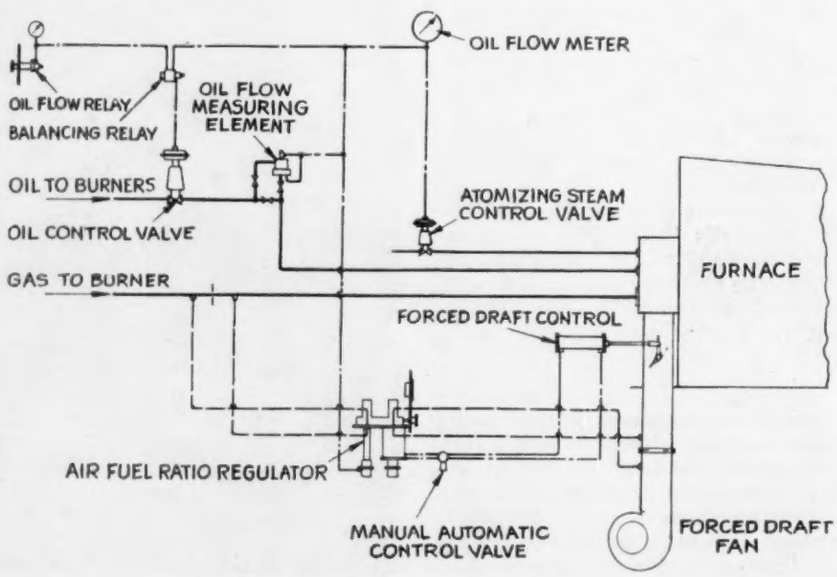


Fig. 1—Typical fuel-air ratio control system for oil and gas firing

Stressproof News

T. M. REG. U. S. PAT. OFF.

Presenting News of a New Cold Finished Steel Bar

By LA SALLE STEEL COMPANY — **Chicago, Illinois**

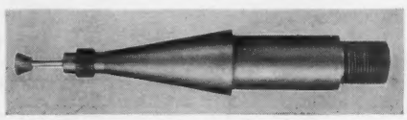
EXTRA! STRESSPROOF No. 2 is the trade name for La Salle's new cold finished bar steel possessing unique wearability, high strength, free machinability, and non-warping qualities *right in the bar*. It requires no heat treating or carburizing.

ARBOR READY FOR USE WITHOUT STRAIGHTENING

Deformation After Machining Is Eliminated; Replaces SAE 3140

A glance at the cost records on machining arbors used for milling small fiber gears shows how one manufacturer recently cut costs. He had been using heat treated SAE 3140, an expensive alloy steel of poor machinability that warped in machining, necessitating a straightening operation.

His hunch to change to STRESSPROOF No. 2 was more than justified by its cost and performance record. Examination of



that record discloses that the item "straightening" had been entirely eliminated, and a better finished product secured—all as a result of the greater accuracy and improved finish obtainable with STRESSPROOF No. 2.

In addition, the new steel cost less than heat treated SAE 3140, and contributed a vastly improved machinability that still further punctured costs and added measurably to tool life.

Based on that record, the manufacturer tried and is now also using STRESSPROOF No. 2 successfully for other parts like mandrills, spindles, and boring bars.

Flywheel Bolt Production Stepped Up 88%; Tool Life Increased 13 Hours

Constant search for materials that would permit a substantial reduction in production costs at no sacrifice in quality led a farm equipment manufacturer to make exhaustive tests of steels available for engine flywheel bolts. His report on the steel previously used, heat treated and cold drawn 3135, and STRESSPROOF No. 2 is typical of the experience of users in many lines.

The superior machinability of STRESSPROOF made possible an 88% increase in bolt production, an increase of 13 hours in tool life, and the production of bolts possessing such smooth threads and smooth finish that no grinding was necessary. Fracture tests showed that the STRESSPROOF bolts were more than strong enough to withstand the required loads.

Manufacturer Finds New Bar Steel Assures Longer Wearing Shaft

Refrigerator Compressor Shaft
(See article in column 3)

Cites Test on Refrigerator Compressor Shaft as Proof of Better Wearability

How the use of a new steel increased the service life of one of his most vital parts was recently disclosed by a prominent manufacturer of refrigerating equipment. The part is a compressor shaft, on which unusual demands for wear are made.

The manufacturer reports that these shafts as made from STRESSPROOF No. 2 steel bars now outwear a bronze bellows seal—an unusual occurrence in view of the fact that previous case carburized hardened and ground SAE 4615 shafts had consistently worn out before the bellows seal.

Such performance is particularly appreciated by the service department, which reports that replacement of the bellows seal takes but 1½ hours, compared with the 6-hour job of renewing the shaft.

Anxious to know just how much punishment the STRESSPROOF shaft could take, this manufacturer outlined an accelerated service test of 8,219 hours which the shaft withstood without showing measurable wear, a running time far in excess of the former case carburized shafts.

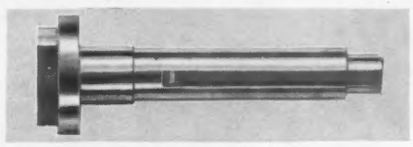
He also claimed that while the wearing qualities alone were sufficient to dictate the use of STRESSPROOF, he received a bonus of 59 cents per shaft in the form of lower material and production costs—the latter as a result of the elimination of case carburizing, straightening, and grinding operations and improved machinability.

Interesting corroboration of this refrigerator manufacturer's experience was lately received from another who ran a STRESSPROOF shaft for 291 days in an accelerated breakdown test without measurable wear.

SAW FIRM TELLS OF 11c SAVINGS PER SPINDLE

Change to STRESSPROOF No. 2 From SAE 6145 Ups Output 38%

After making extensive tests several months ago, an electric saw manufacturer was convinced that a change in steel was called for; particularly when he found that he could obtain savings of 11 cents per spindle and still maintain satisfactory



strength. By replacing *hot rolled* SAE 6145 with STRESSPROOF No. 2, production has been increased 38%, warpage has been eliminated, all failures due to twisting have been eliminated, and 1,500 parts have gone into service without a single failure. Although the shafts made from SAE 6145 were heat treated and straightened after machining, subsequent distortion occasionally resulted in service failures. The unique in-the-bar qualities found in STRESSPROOF—non-warpage, strength, and wearability—make it an ideal steel for this part as well as idler pinions, small pinion gears and jig saw cams which have recently been added to this maker's list of STRESSPROOF parts.

When Not to Use STRESSPROOF No. 2

STRESSPROOF No. 2 by reason of its unique wearing qualities can be substituted for case carburized steel in many applications. It should be noted, however, that STRESSPROOF No. 2 has a Yield Strength of 100,000-lbs. p.s.i. minimum, and, therefore, is not suitable for parts case carburized and subjected to higher unit pressures and severe Brinelling action.

ADV.—Several hundred companies now use STRESSPROOF Cold Finished Steel Bars in a wide variety of applications. Use coupon on page 2 to get booklet suggesting ways you can save by using this new steel.

One Successful Use Leads To Other Applications By Washing Machine Co.

On the basis of tests which showed that case carburizing could be eliminated on many applications by using STRESSPROOF No. 2, a washing machine company replaced

case carburized SAE X-1315, with this new cold finished bar steel for the worm shafts shown above. Despite a saving of 8 cents each on these particular parts, it did not occur to the company until recently that STRESSPROOF could be applied to advantage in the production of other of its

(Continued on Page 2, Col. 2)

GEAR MAKER DISCOVERS THE "IDEAL BAR STEEL"

Says "In the Bar" Qualities Cut Out Extras, Make Better Parts

The illustration at the right shows a selection from the production line of the various stages in the machining of a super charger worm gear as currently being made by a well-known gear manufacturer. He explains the need for perfect concentricity and balance in this part by citing the rate at which it travels in use—7 times engine speed. With the steel formerly used, SAE 3140, the part required heat treating after machining, with consequent warpage and noisy operation. The use of non-warping steel that required no treatment after machining was indicated.

A trial of STRESSPROOF No. 2, he reports, not only solved the warpage problem, but provided parts that machined more easily, and more than met the need for wearability and strength. As he puts it, this new bar steel is "ready to machine as received, ready to use after machining, possessing every property a bar needs to be termed the ideal material for the part".

From scores of other sources have come similar reports of the "in-the-bar" qualities of STRESSPROOF No. 2—an almost unbelievable combination of strength, resistance to wear, machinability and non-warpage that eliminates the need for case hardening, or heat treating and subsequent straightening, cleaning, and grinding on many applications.

FROM BAR TO GEAR IN FIVE STEPS

(See Article in Adjoining Column)

1. STRESSPROOF No. 2 Bar as Received.
2. Bar Stepped Down.
3. Bar After Forming.
4. Bar Drilled and Ground.
5. Finished Gear Cut—Part Ready for Use in Supercharger.

One Use Suggests Another—

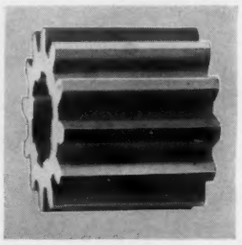
(Continued from Page 1, Col. 3)

products. Yet this steel bar often shows even greater savings in washing machine parts like these: wringer cams, spreader cams, wringer gears, worm gears, stub shafts, bearing block studs, crank shafts, racks, and other gears.

SFPM INCREASED FROM 70 TO 110 ON DRIVE GEAR

Tool Life Tripled By Replacing SAE 3135 with STRESSPROOF No. 2

Shop records which showed that the slow cutting speeds necessary on SAE 3135 were responsible for high unit costs on drive gears is reported by a prominent manufacturer as the reason for the switch to STRESSPROOF No. 2. The high degree of machinability provided by the new steel has made possible an increase in cutting speeds from 70 to 110 surface feet per minute, an increase in shaping speeds from 33 to 55.



Even at these higher speeds, tool life is reported to have been increased from 20,000 to 60,000 pieces on one operation, and from 5,000 to 15,000 pieces on another.

Besides solving his machining problem, the manufacturer found himself in possession of still other advantages. With STRESSPROOF No. 2 he reduced the total number of operations from 15 to 7. This uniformly strong, non-warping, faster machining bar steel allowed the elimination of heat treating and other operations like sand blasting, reaming to fit the broach, grinding to size, de-magnetizing, burnishing, wire brushing, and lapping on the end. All told, the savings, despite a slightly higher initial material cost, amounted to 57c per part.

SHOP KINKS

● A master mechanic says it's good practice to keep STRESSPROOF bars on hand for maintenance as well as production uses. He says, "In our shop constant replacement of bolts and pins on the universal joint of our straightening machines was a real problem. We experimented with many types of steel, including SAE 1020, SAE 3135, and SAE 4140, but still had to replace a half-dozen or more bolts every eight hours. Then we tried STRESSPROOF No. 2 and now change bolts and pins only at 10-day or two-week intervals."

WANTED—*Your Shop Kink.* Send your "Kink" today to La Salle Steel Company.

Read How STRESSPROOF Bars Simplify Buying and Cut Production Costs

Today several hundred companies are deriving economic benefits from the unusual combination of engineering properties obtainable in cold finished STRESSPROOF steels in a wide variety of applications. Such astounding acceptance of this new bar steel certainly justifies your taking the initial step in determining whether you, too, can make better parts for less cost than with your present steel. Send today for the descriptive bulletin which describes STRESSPROOF and gives actual cost studies. Metallurgical engineering services on any specific production problem will also be furnished.

THIS BULLETIN TELLS

1. **Properties of STRESSPROOF Cold Finished Steel Bars.**
2. **Case Studies of Actual Production Savings.**

La Salle STEEL COMPANY

Manufacturers of the most complete line of Cold Finished Steel Bars in America

PRINTED IN U.S.A.

Write Today for STRESSPROOF *Bulletin*

La Salle Steel Company, P. O. Box 6800, Dept. 9A
Chicago, Illinois

Please send your STRESSPROOF Comparative Cost Data.

☐ Have a representative call.

Name_____ Position_____

Firm_____

Address_____

pressure from the oil-measuring device. In addition to controlling air flow the impulse from the oil measuring element may be transmitted to the pressure type oilflow meter and also to the atomizing steam control valve to provide the necessary atomizing steam pressure.

If gas is being used on the furnace, the oil-flow relay is turned to the off position whereupon the oil-control valve is closed. Since the oil flow falls to zero, the impulse pressure from the oil-flow measuring element likewise is reduced to zero. Hence, the loading on the bellows adjustment of the air-fuel ratio regulator is reduced to zero. If gas then is admitted to the burner, the differential pressure across the gas measuring orifice is impressed on the loading diaphragm of the air-fuel ratio regulator, which immediately calls for the corresponding differential pressure drop across the air measuring orifice to restore balance to the regulator.

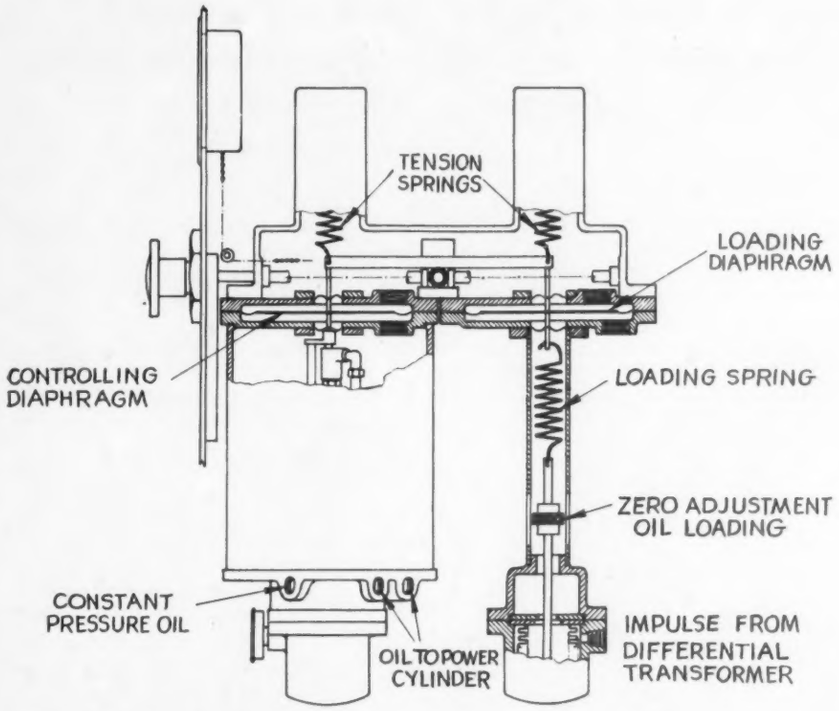


Fig. 2—Details of bellows loaded type regulator unit

Fig. 2 shows method of attaching the oil loading bellows to a standard Hagan air-fuel ratio regulator. The gas and air diaphragms are untouched. The oil loader is attached and so adjusted that when it is in the zero oilflow position, the balance beam of the regulator is in equilibrium. It is apparent that when gas is in use and oil is not, the oil flow loading does not affect the operation of the regulating unit in any way. Likewise, when oil is being used and gas is not, the gas differential is reduced to zero, hence does not affect operation of the unit.

The idea of firing oil and tar in soaking pits and reheating furnaces, already designed and equipped for gas firing, has received much attention during the past year. Suitable equipment for fuel-air ratio control, on oil or tar as well as gas, however, has been unavailable until recently, making it necessary to install duplicate fuel-air ratio control for oil.

To supply the need for such equipment without resorting to duplication of apparatus, the combination tar and oil measuring and regulator loading system described above was developed.

Clean Steel Made In Open-Hearth

■ PROGRESS in manufacture of fine-grain clean steel has been facilitated in France and Poland and, in a preliminary way, in the United States, through further development of the process of mixing molten metal with slags, invented and first applied to steel made in the electric furnace, by Rene Perrin, Ugine Steel Works, Savoie, France, in 1930 and 1931.

Information gathered lately shows that these recent improvements were conceived by the inventor as a result of an exchange of ideas he has had with a large American steel company whole problems were specially relative to cleanliness. This American steel company had found it relatively easy to manufacture, in its large open-hearth furnaces, steels with a "MacQuaid Ehn" grain-size either large or moderate which were relatively clean when examined through the microscope. The problem was quite different when it tried to make steels with a fine grain-size of 6-7 or 6-8.

Reduce Aluminum in Slag

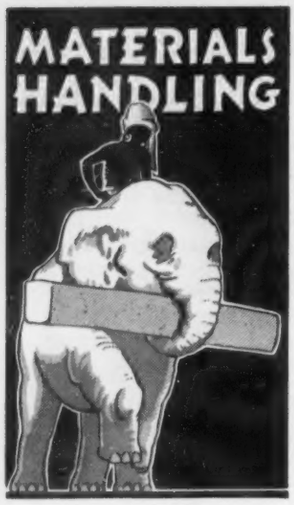
This company asked Mr. Perrin if it would be possible to solve the problem by means of mixing the metal with slags, and he came to the conclusion that such a result could be obtained if it were possible during the agitation in the ladle to incorporate some aluminum in the steel by means of the reduction of the alumina contained in the slag.

The inventor succeeded in arriving at a technique which gives these results, and is manufacturing in this way clean fine-grain steels, which metallurgists in other countries also consider to be clean. At Ugine a considerable improvement in the mechanical properties of steels, especially in regard to impact values, not only longitudinally, but even more in the transverse direction, was obtained at the same time. The use of their slags was then generalized at Ugine, where all the steels are manufactured in accordance with their methods, resulting in considerable technical and commercial advantages.

Apart from experiments that gave good results, the industrial exploitation of Mr. Perrin's process with fixed quick-melting open-hearth furnaces of 40 tons capacity is now an accomplished fact at steelworks in Poland. These steelworks, up to recent times, manufactured only plain carbon steel of current quality, and were thus able, right from the first melts, to obtain carbon steels of high grade and special steels, particularly fine-grain nickel-chromium steels, for all purposes. These steels are micrographically clean; their content of sulphur is less than 0.01 per cent and, therefore, less than that of usual electric steels; the mechanical characteristics, both longitudinal and transverse, are excellent.

It has also been demonstrated that it is possible, by means of Perrin's processes, to manufacture, by the simple operation of mixing with molten slag, steels that are at least equivalent in quality to good electric steels by means of the open-hearth furnace with charges of relatively phosphoritic pig iron and scrap of quite ordinary quality. Apart

(*Please turn to Page* 66)



Conveyor Mountings

For maximum life, conveyor belts must be protected adequately against excessive impact of material at loading points. Here an authority describes several methods and a new type of idler mounting

By **PAUL W. VAN ORDEN**
Manager
Belting Division
B. F. Goodrich Co.
Akron, O.

■ A MAJOR cause of belt failure is severe impact at loading points. Many people have the erroneous idea that because rubber is highly elastic it is compressible. Fact of the matter is rubber is not compressible and must absorb shock or impact by distribution of the load over an area larger than the actual point of impact. In general, it can be said that the ability of rubber to absorb impact varies as the square of the increase in thickness. Thus a ¼-inch thick belt cover can absorb four times as great an impact as a ⅛-inch cover; a ⅜-inch cover can absorb nine times as much impact as one ⅛-inch thick.

Within its ability to distort freely and distribute impact, a belt cover will not be injured. Beyond this limit of distortion, the cover may be ruptured and the belt carcass cut and gouged.

To minimize impact, material should be loaded on the belt as gently as possible. This requires sufficient head room to install properly the correct chute, grizzly, vibrofeeder, reciprocating shaker, pan conveyor or other type of feeding or delivery device.

Material being loaded on a belt should hit midway between two supporting idlers—not directly over an idler. If the load is applied directly over an idler, lumps of material strike the belt like hammers on an anvil. If the load is fed onto a belt between idlers, the belt can deflect downward freely when struck by large lumps and so is less likely to be damaged. The belt should be free to take this deflection for the same reason that a man catching a baseball lets his arm recoil with the ball to lessen its impact.

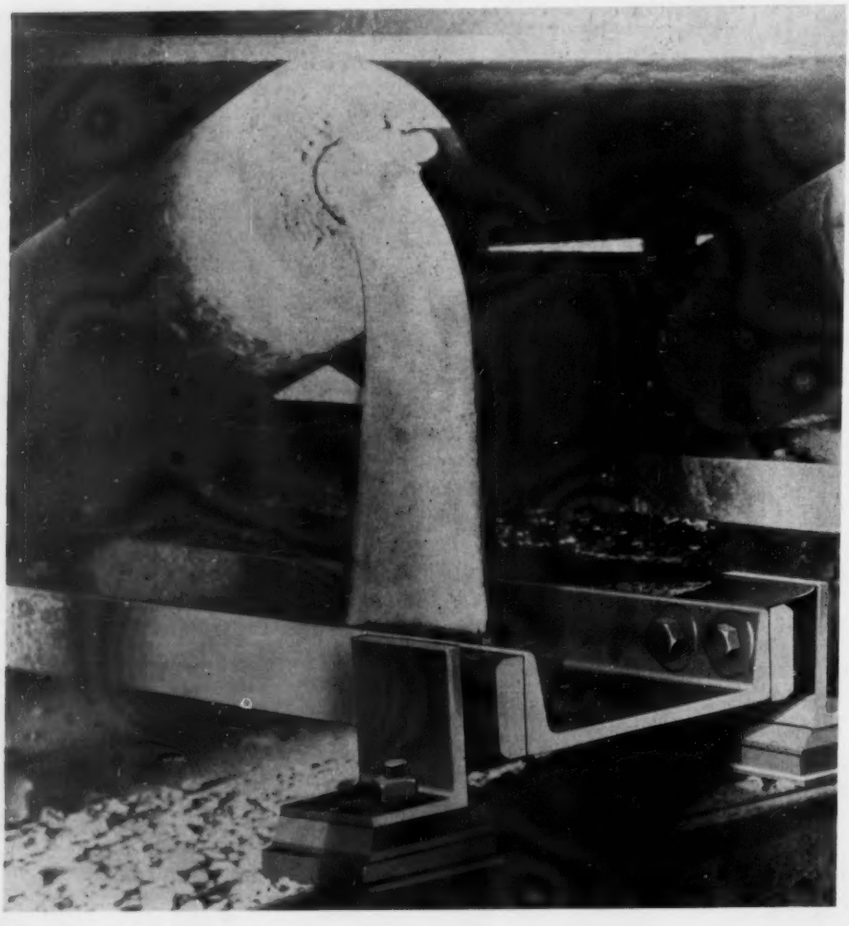


Fig. 1—Typical application of rubber impact-absorbing mounting on one end of channel supporting belt conveyor idler

Lengthen Belt Life

Under ideal loading conditions, shock absorbing, mountings for conveyor idlers may not be necessary. However, where the ideal design is impossible or an original design proves faulty, belt life can be increased greatly through the use of shock impact mountings. Principal methods of absorbing impact are:

Rubber-covered conveyor idlers immediately beneath point of feed.

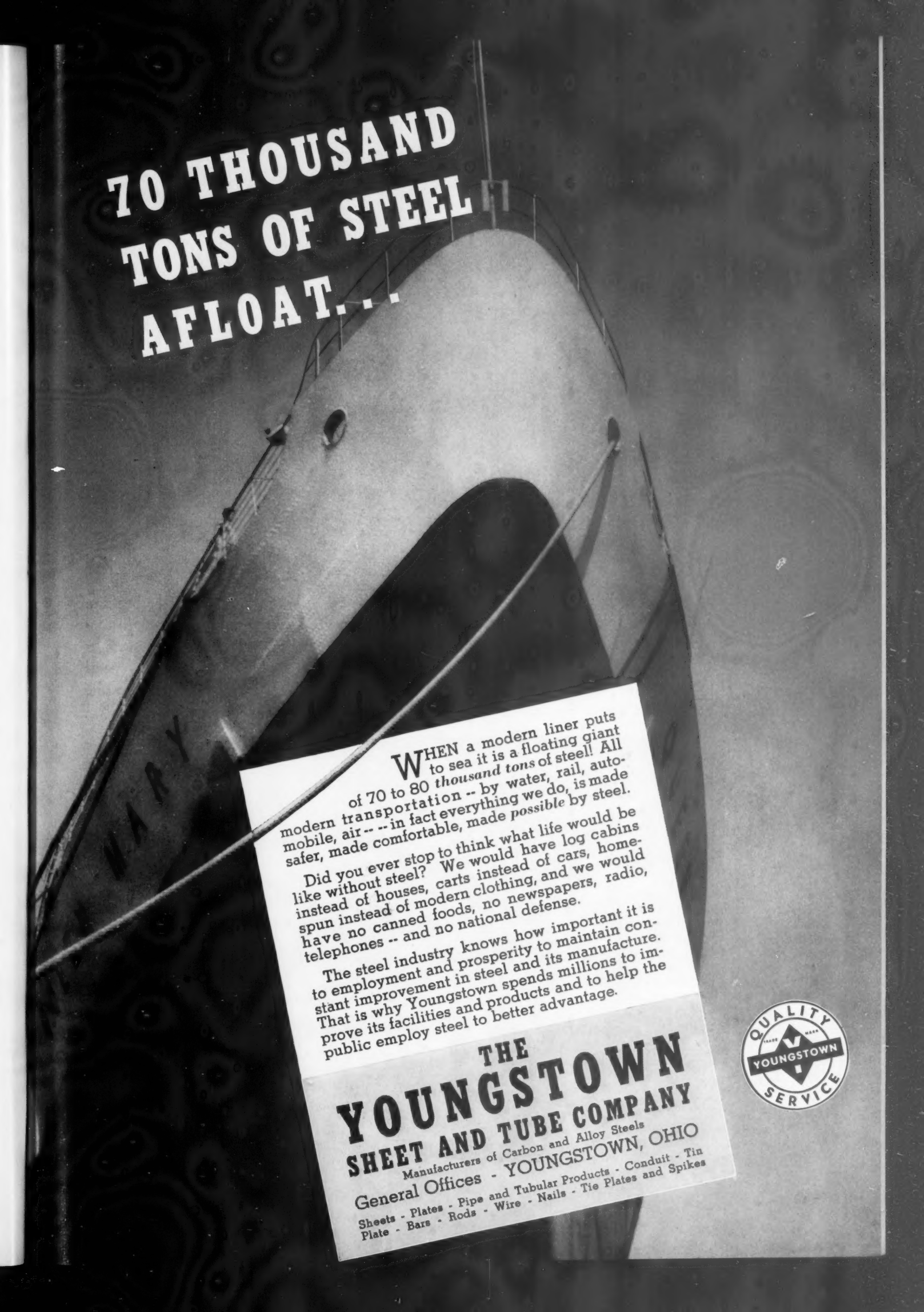
Idlers made by assembling T-shaped rubber sections on a shaft.

Idlers mounted on a bed or frame supported by metal springs.

Idlers formed of small pneumatic tires on shafts.

Goodrich shock impact mountings, Fig. 1.

Impact must be transmitted to a rubber-covered idler directly through



WHEN a modern liner puts to sea it is a floating giant of 70 to 80 *thousand tons* of steel! All modern transportation -- by water, rail, automobile, air -- -- in fact everything we do, is made safer, made comfortable, made *possible* by steel.

Did you ever stop to think what life would be like without steel? We would have log cabins instead of houses, carts instead of cars, homespun instead of modern clothing, and we would have no canned foods, no newspapers, radio, telephones -- and no national defense.

The steel industry knows how important it is to employment and prosperity to maintain constant improvement in steel and its manufacture. That is why Youngstown spends millions to improve its facilities and products and to help the public employ steel to better advantage.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - YOUNGSTOWN, OHIO

Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate - Bars - Rods - Wire - Nails - Tie Plates and Spikes

QUALITY YOUNGSTOWN SERVICE

You will be WELCOME *at Exhibit* 5308

Here visitors to the Cleveland Show will take advantage of the opportunity to become familiar with the profit possibilities of the latest Jones & Lamson equipment, including several new machines never before displayed. . . . Plan now to be one of the first to visit this exhibit of Jones & Lamson machines built not only for the high speed tools of today but to handle the tools of tomorrow and handle them at a profit.

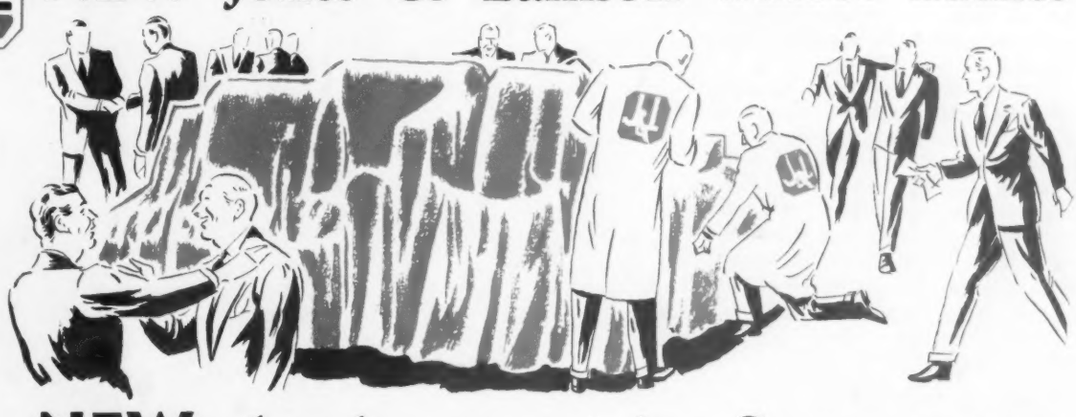
JONES & LAMSON MACHINE COMPANY, SPRINGFIELD, VERMONT, U. S. A.

"THE WHOLE GANG WILL BE THERE"

NEW developments in Automatic Thread Grinders

NEW Jones & Lamson Fay Automatic Lathe

NEW Jones & Lamson Turret Lathes



NEW developments in Comparators and Threading Dies

the conveyor belt. In this transfer, the belt absorbs a good portion of impact within itself. The idler covering should be as thick as practical to provide adequate cushion. A solid rubber idler with only the supporting shaft of steel would be preferable to the conventional idler with a relatively thin cover.

The design of the T-shaped segment idler is to provide for greater movement of the rubber, approximating the result obtained by use of a pneumatic tire.

Spring supported frames and pneumatic tire idlers prove satisfactory but are usually quite expensive.

Mountings Permit Recoil

Shock impact mountings, as designed by Goodrich, permit the entire belt, idler and frame to recoil from impact. This recoil is absorbed by the movement of rubber in the mounting. Because this rubber is in shear, not in compression, it distorts easily and absorbs impact without damage to the belt cover. Excellent results have been obtained with this simplified mounting and its cost is most reasonable.

Four of these mountings are used normally on each idler frame, as shown in Fig. 2. Use of four mountings is reccommended to give the best load distribution and adequate stability to the idler. Belt movement on the idler plus impact above the idler, tends to tilt it forward in the direction of belt travel. Installation of four mountings instead of two prevents this forward movement.

The mountings are fastened through the angle iron of the mounting to the conveyor "stringer." The mounting angle iron is drilled at time of installation. To fasten mountings to an idler, it is first necessary to mount the idler on a channel iron. Then screw the idler channel iron to the metal face bar of the mounting. The metal face bar is drilled and tapped at the factory and furnished with ¼-inch diameter SAE heat-treated cap screws.

There may be some special applications where a number of horizontal idlers are located immediately below the loading point. These idlers may be so close together that it would be impossible to place each idler on four mountings. When such a case is encountered, a single long mounting can be placed parallel to the edge of the belt and the supporting idler frame attached to it.

Different amounts of impact are

(*Please turn to Page* 66)

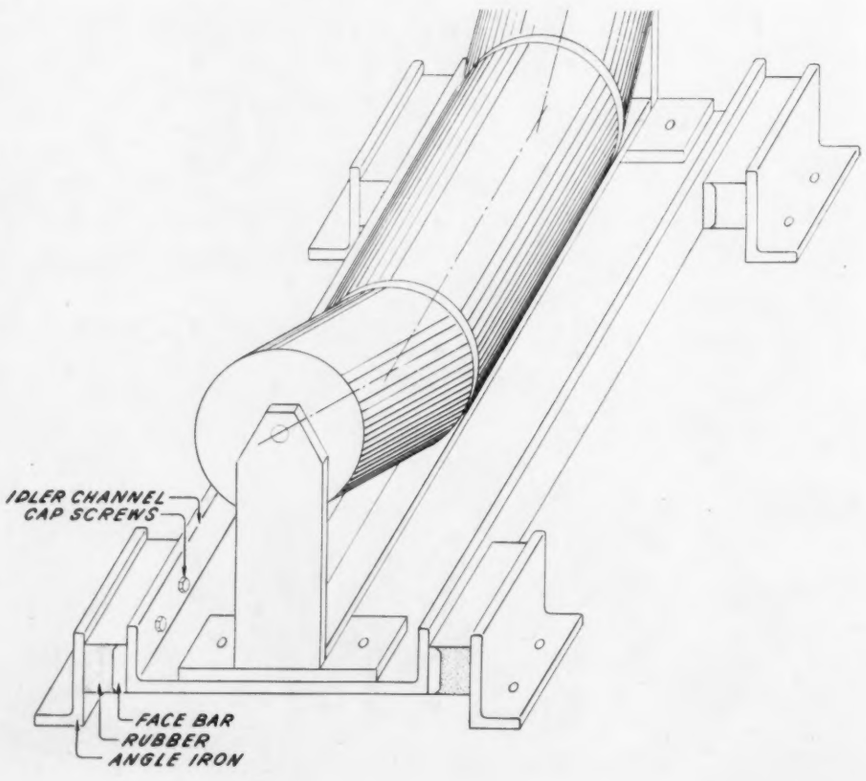


Fig. 2—As shown here, four mounting points utilize rubber in shear for each set of idlers as a means of protecting the belt from excessive impact

Issues Brochure on Chromium Cast Iron

■ "Chromium in Cast Iron" is the title of a 48-page brochure just published by Electro Metallurgical Co., 30 East Forty-second street, New York. It describes the methods employed in producing both high and low-chromium cast iron, and the effect of chromium on the growth of cast iron. It discusses thoroughly the resistance of chromium cast iron to oxidation and corrosion, also the effect of chromium on the strength, hardness, wear-resistance, machinability and other characteristics of cast iron. The brochure contains complete information as to heat treatment and welding of chromium cast iron, also as to the effect of other elements on this material.

Statistics of Steel, Iron in United Kingdom

■ *Statistics of the Iron and Steel Industry*, 1938; compiled by British Iron and Steel Federation, London; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S. W. 1.

This is the most complete book of statistics relative to the iron and steel industry of Great Britain that can be obtained. It contains 56 pages and 70 tables, most of which give not only figures for 1938, but also comparative figures for previous years.

Tables give full statistics of production and disposal and materials consumed for pig iron, ferroalloys, steel ingots and castings. Production figures are also given for semi-finished steel, finished steel and wrought iron.

Information is given in regard to labor and wages, and prices quoted on certain iron and steel products.

Production and imports of ores, coal and coke are also covered, various tables of imports and exports of iron and steel by product and by country and scrap import and export figures.

There is interesting information concerning shipbuilding, production of automobiles and the number in use, and building plans approved.

Among the new tables introduced this year are two showing production of pig iron and of steel each month for the last three years and for 1929, facilitating comparison of the output figures month by month.

Tube Drawing Compound

A new development of Nopco Laboratories, Harrison, N. J., is a stable paste compound, Nopco No. 2261, of high titre fats. It is readily soluble and is formulated specifically for the lubrication of heavy draws in 5 per cent solution and is recbrass tubes, particularly where large reductions are made. It is effective in 5 per cent solution. It is also recommended as a lubricant for drawing heavy brass and copper shells. Because it consists primarily of vegetable fats, it is not subject to development of odor or rancidity on drawn stock.

INFINITE CARE

Produced the *STEEL* for This Crankshaft

At first glance, there is nothing unusual about the crankshaft illustrated here. But if this piece of forged steel could speak, what a story it could tell!

It would be a story in keeping with WISCONSIN STEEL COMPANY'S high standards . . . of precision manufacture from raw material to finished product . . . of one rigid inspection after another . . . of carefully selected materials. The result is a finished product that *stands up under the most exacting demands of the automotive industry.* We are proud to say that Wisconsin Steels play an important part in the manufacture of these parts which demand the highest quality.

Supplying the best automotive steels it is possible to produce is only one of the many services we render to industry at Wisconsin Steel. Our plant is well equipped to make a wide variety of alloy and carbon steels. We invite you to write or phone us about your steel problems.

WISCONSIN STEEL COMPANY Products

Open Hearth ● Alloy and Carbon Steel ● Round, Flats, Squares, Bands, Skelp, Screw Steel ● Agricultural and Special Shapes, Reinforcing Bars ● Structural Angles, Beams, and Channels ● Universal Plates ● Cold Drawn and Turned Shafting ● Billets, Blooms, and Slabs ● Pig Iron (Malleable, Foundry, Bessemer, and Basic)

WISCONSIN STEEL COMPANY

180 North Michigan Avenue Chicago, Illinois

WISCONSIN

Alloy and Carbon Steel Pig Iron

NATIONAL METAL EXPOSITION

INTERNATIONAL AMPHITHEATRE
CHICAGO
OCTOBER 23-27

The editorial material and the advertisements in this issue will give you an up to the minute picture of what's new and unusual in methods, materials, metals and equipment.

If you attend the show, this issue will help you to plan your time.

If you can't attend, its completeness will bring the show to you.

Write for further information if you are interested in the advertising possibilities.

PARTICIPATING SOCIETIES

American Society for Metals
Wire Asssociation
Institute of Metals Division, A.I.M.E.
Iron and Steel Division, A.I.M.E.
American Welding Society

STEEL

PENTON BUILDING • CLEVELAND

Trailer Frame

New unit eliminates sidesway, provides good road stability, reduces costs by 20 per cent. Vertical load on tow-car is adjustable. Welded wheel is 25 per cent lighter, 15 per cent cheaper

By RAY HARROUN
Development Engineer
Saginaw Stamp & Tool Co.
Saginaw, Mich.

■ MANUFACTURE of trailers is passing through a stage of rapid development toward a quality product. Such development is so influenced by changing highway traffic laws that any new design or manufacturing practice which can even hold its own without increasing cost

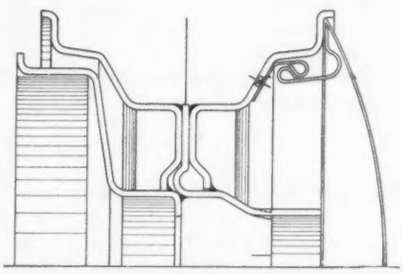


Fig. 1—Cross section through arc welded steel wheel

is an achievement. Two trailer manufacturers have standardized on the frame construction described here because of its outstanding advantages.

To provide the necessary resistance to torque forces and sidesway, a tubular self-locking structure is employed using welding in such a manner that there is little possibility of lowering physical characteristics of the materials at the welds. Also welding work here is not so dependent upon the human element as some other types of construction, so more uniformly high-grade results can be counted upon. It is this feature that possibly makes this unit of most interest to manufacturers of other types of equipment.

Figs. 2 and 3 show skeleton views of tubular structures featuring rectangular longitudinal frame members through which are passed round tubular cross members, the latter being arc welded to the longitudinal members to form an integral joint which combines the safety factor of both a mechanical interlock and a welded bond. This type of structure enables the application of spring and axle suspension by use of shackles mounted on the cross tubes in such a manner as to insure maximum stability.

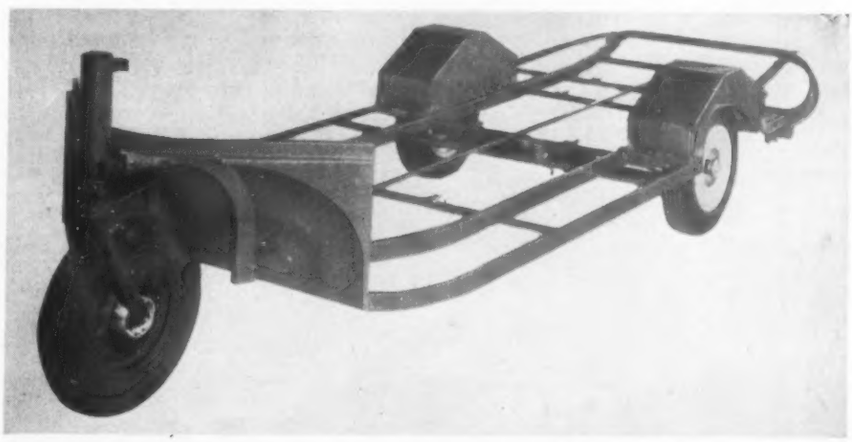
Stability in a trailer is of utmost importance not only from the standpoint of comfort, but also is most essential for safety when traveling at high speeds on the road.

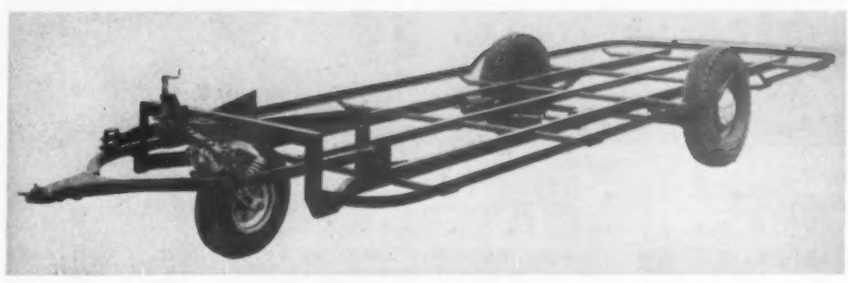
Material for the frames consists of standard steel tubing which can be drawn from warehouse stocks, thus fitting into low-quantity production schedules.

Floor loading problem in a trailer is different than in an automobile. It is easy to overload the floor of a trailer because of the full head room and large area. To meet this requirement, continuous tubular members interlaced with longitudinal sections afford ample strength and make a structure highly resistant to torsional loads as well.

A third wheel is incorporated to make the vehicle an independent mobile unit when unhitched from

From paper receiving award in automotive trailers classification of $200,000 program sponsored by James F. Lincoln Arc Welding Foundation, Cleveland.





Figs. 2 and 3—Two variations of the tubular construction described. Units made entirely by arc welding

the tow car. Also, this eliminates necessity of the prime mover's supporting any of the nose load of the trailer. A number of models contain provision in the hitch mechanism for adjusting the amount of load which can be carried by the rear end of the tow car. In addition, the kind of hitch employed shares the transfer of additional load to the tow car's rear wheels during de-acceleration only, especially when descending hills. This feature assures better braking traction on all effective wheels and prevents tendency of jackknifing or buckling at the hook-up point.

Light-Gage Materials Used

Thanks to welding, the structure can be made from light-gage materials and yet be sufficiently rigid to withstand all loads and shocks to which it may be subjected. Also, the design is extremely flexible, thus easily accommodating variations in size and load-carrying capacity which constitute a large portion of the actual plant production.

A notable fabricating feature about this design is the manner in which actual welding is facilitated and good quality assured. Since all welding is carried on at points where tubular members pass through beams, all welded joints are circular. All welding can be done in a position permitting high speeds and quality of weld deposit.

Frame consists of longitudinal members of 3 x 1¾-inch. These are rectangular tubes with a 13-gage wall. Cross tubes are 1⅝-inch diameter with a round cross section and a 12 gage wall.

Suspension shackles are of heavy, rigid construction mounted directly on the cross tubes. Springs are 38 inches long, mounted on top of axle and perfectly straight when fully loaded, thus eliminating sidesway. The axle is 1¾ inches square with a 5½-inch drop on the heavy-duty chassis and 1½ inches square with 5-inch drop on the medium-duty model.

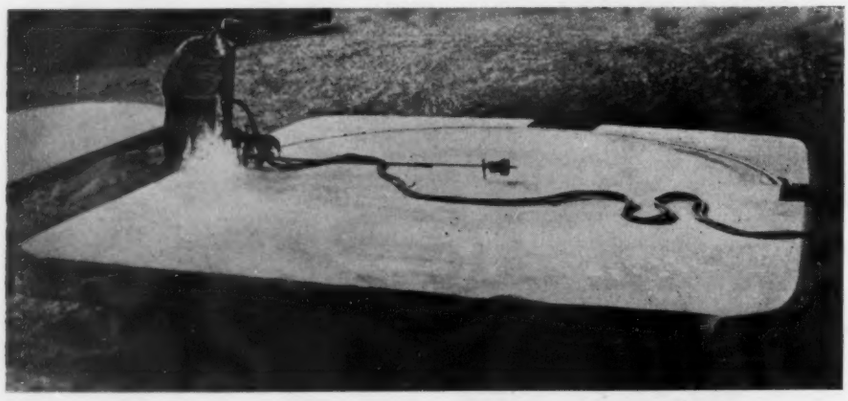
Dimensions of frame are 18 feet x 0 feet 8 inches. Floor is 16 inches high from ground. A 2 x 2 x ⅛-inch angle rail is used all around the sides and ends with 10-inch radius at all corners. Wheel center line is 6 feet 1 inch from extreme rear end. Pickup over front wheel is 11 inches high and 24 inches deep from front end of frame. Longitudinal frame member spacing is 41 inches; tread, 64 inches. Heavy-duty chassis weighs 3500 pounds, and light-duty chassis weighs 2500 pounds.

Brakes are double action with vacuum-control cylinder mounted in the center of the chassis with air lines running to quickly detachable hitch connectors at the front. Electric brakes are available, also.

Fig. 1 shows an improved wheel, the result of experience gained in making five million wheels. This unit is made entirely from heavy, sheet steel sections blanked and formed to shape and assembled by arc welding. The darkened fillets indicating welded joints are shown on Fig. 1. This design eliminated much previous machining work. All welding is circular and thus can be handled easily on rotating welding jigs which are simple to construct and operate.

This welded wheel is 15 per cent lighter than conventional wheel, and the cost figures show an approximate reduction of 15 per cent for the welded design. In addition, the lighter wheel greatly reduces unsprung weight of the vehicle—a further important advantage.

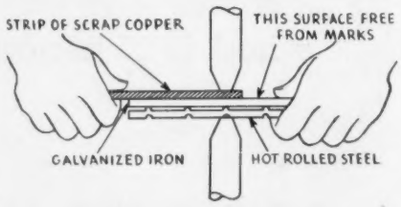
Flywheel From Steel Plate



■ **From this rolled steel plate, 200 x 170 x 9⅛ inches, weighing 87,090 pounds, By-Products Steel Corp., Coatesville, Pa., flame-cut a circular plate 165¼ inches in outside diameter, weighing 56,315 pounds, which was then machined, for Mesta Machine Co., Pittsburgh, into what is claimed to be the largest steel plate flywheel ever made**

Galvanized Iron Spot-Welded Without Blemish

■ In order to join 16 gage hot rolled steel to 20 gage galvanized iron by spot welding without marking the exposed surface of the galvanized piece, Thomson-Gibb Electric Welding Co., Lynn, Mass., has devised a method using a strip of copper between the galvanized sheet and the electrode and small projections on



A strip of 1/16-inch copper used in this way has been found effective in preventing blemishes on outer surface of galvanized iron in spot-welding

the hot rolled steel. At first only the projections were used. This worked well except that after a dozen or so welds the electrode touching the galvanized surface picked up enough zinc to raise the heat gradient at the point and cause a blemish. A small strip of 1/16-inch scrap copper placed between the galvanized surface and the work, as shown in the illustration, and moved every few welds was found effective. Now electrodes seldom need cleaning and no blemish appears on the work.

•

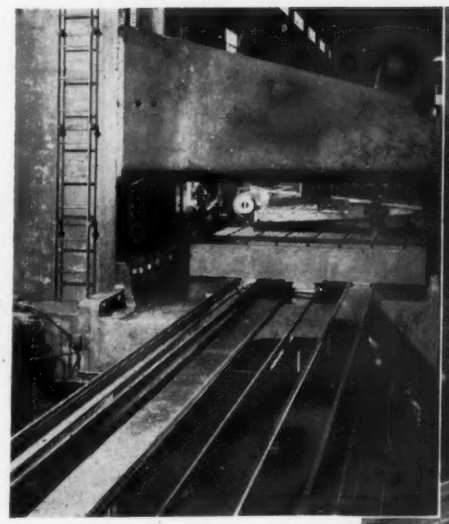
Solvent Cleans Metal

■ A solvent known as "Gunk," for cleaning small metal parts, combining soap and water detergency with the high solvent performance of benzines, has been developed by A. F. Curran, research and development chemist, Curran Corp., Malden, Mass., and placed on the market by Bockstanz Bros. Co., 131 West Woodbridge street, Detroit. The new solvent is sparkling clear in appearance, highly penetrating and noninflammable. Small metal parts, stampings, extruded shapes or die castings dipped in the solvent assume a scoured appearance without etching, marking or loss of weight. Such parts may be rinsed by sluicing with water to obtain chemically clean surfaces where painting or lacquering is to follow. It is said that where prevention of storage corrosion is desired, the parts need not be water rinsed, but simply drained or centrifuged to remove excess volume. The light phenolic-type film will act as a rust preventative, making treatment with oil unnecessary.

"GULF HARMONY OIL

has helped us improve the operation of this big planer"

. . . says Plant Engineer



On this huge open-side planer the stern post for the steering apparatus on a great ocean liner is being finished. Gulf Harmony Oil E is used in the circulating system as recommended by the Gulf engineer shown in the picture at the right, consulting with the plant engineer.

"This Gulf Engineer gave us the right Recommendations"

"THIS planer is doing better work since we standardized on Gulf Harmony Oil for its lubrication," says this plant engineer. "We are having no more trouble with chattering or vibration and our production has been greatly improved."

Is the costly machinery in your plant making the kind of production records you have a right to expect from it? If not, here is a practical suggestion: Call in a Gulf lubrication engineer and ask him to look over your equipment, suggesting proper lubrication practice for each machine and moving part. This cooperative service costs you nothing, but will help to insure maximum efficiency from your equipment and ultimate economies in its operation. Savings in power and maintenance, smoother operation and improved production from each machine usually accompany this careful attention to lubrication.

You can start getting those savings now! Write or 'phone one of Gulf's 1100 warehouses located at principal distributing points from Maine to Texas, and ask that a Gulf engineer call on you to discuss your problems. You will be under no obligation . . . Gulf Oil Corporation — Gulf Refining Company, General Offices: Gulf Building, Pittsburgh, Pa.

GULF INDUSTRIAL LUBRICATION

ALSO A COMPLETE LINE OF FUEL AND FURNACE OILS

Drying by Radiant Heat

New method develops heat at surface of metal, thus drying finishes from the inside outward. Primer coat on auto bodies is baked in 15 minutes. Method extremely flexible in application, has high overall efficiency of 57 per cent

■ ALTHOUGH radiant heat has been used in a limited way ever since articles were first placed in the sun to dry, its commercial use in the metalworking field has come only within the past few years. One of the first noteworthy installations was made at the Ford Motor Co., Dearborn, Mich., for drying paint in 1935. An accompanying illustration shows how car bodies now are passed through an "oven" comprising 4000 gold plated reflectors with heat lamps to bake the paint finish.

Technically, radiant heat is energy longer in wave length than visible light emitted from a heated body, as distinguished from that transmitted by intervening media such as converted heat carried by air currents or heat conducted directly through physical bodies. Radiant heat travels with approximately the speed of light since it is in substantially the same wave length region. It does not lose its energy until converted into conducted or convected heat, preferably at the point of useful work.

Licensed under Ford patents, the C. M. Hall Lamp Co., Detroit, is producing reflectors for radiant heat service and has supervised installations of various types for drying industrial and automotive finishes from air drying lacquers to high-temperature polymerizing enamels; abrasive material applied in the resurfacing of polishing wheels; photographic negatives and prints; surface moisture on metals; bonding material on glass; lead covered cable; motor and transformer windings; blueprints and photostats; pharmaceutical products; textiles, fish oil, tobacco, latex, glue, paper and cardboard. Trial installations are in operation for the drying of printing ink and battery plates, for the dehydration of greases and lard, ripening of fruit, molding of rubber, baking of pottery, cookies and soda crackers; and the roasting of coffee.

At present, incandescent filament sources used for industrial drying consume in the neighborhood of 250 watts, operating at 115 volts. These devices are no larger than the standard 200-watt incandescent bulb. Filaments are operated at an abnormally low temperature to avoid producing great quantities of unnecessary visible radiation as well as to prolong the life of the device.

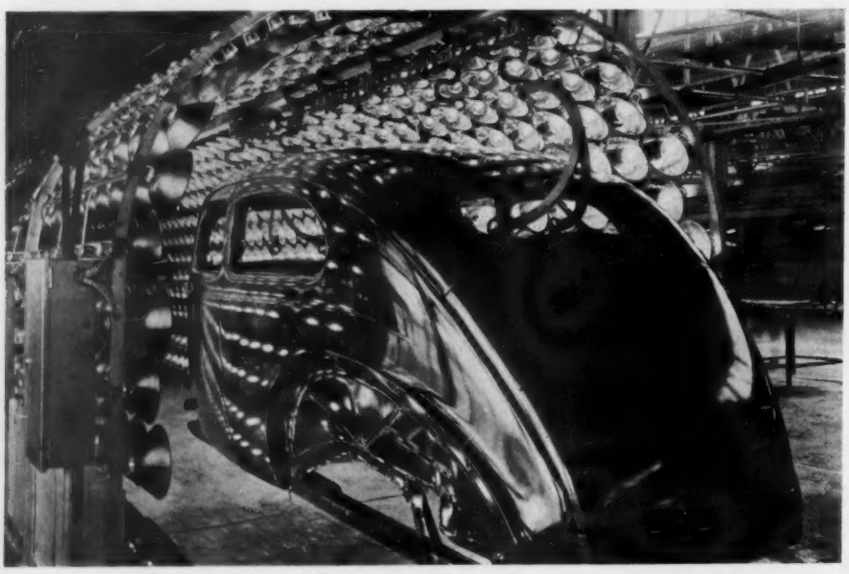


Fig. 1—Ford Rouge plant uses 14,000 gold-plated lamp reflectors to bake paint on Ford and Mercury bodies. About 500 reflectors can be plated with 45 grams of 24-karat gold

Special Reflectors Used

Concentrating-type reflectors are used to direct the radiant energy to the surface to be dried. Since the devices usually are mounted over a conveyor carrying the product, "spottiness" is avoided in drying with the separate beams from the concentrating reflectors. The necessary concentration can be produced by reflectors which are essentially parabolic in shape, although this assumes a theoretical single-point source of energy. The extra-long filament used in the lamp bulb of course is not a single-point source, and if the inner surface of the reflector were perfectly smooth, hot spots would develop because of the multiple reflections of the filament image. To avoid this, the reflector shell is drawn instead of spun from brass sheet and the surface is given a variegated diamond pattern. The true parabolic shape is modified somewhat also.

The accompanying chart, Fig. 2, shows the reflectance of various metals and indicates the high efficiency of electrolytic gold in wave lengths from 8000 angstrom units up. The Hall reflectors are plated with 24-karat virgin gold. Naturally the surface of the reflector must be

SPECIAL BULLETIN

The National Machine Tool Builders Association has postponed indefinitely the Machine Tool Show which was to have been held in Cleveland on October 4 to 13,

however

we are going ahead with our Machine Tool issue September 25. In the combination editorial and advertising sections, this will be a machine tool and accessories show on paper.

Under the circumstances which we are now entering, we feel that we would be remiss in our duty were we not active in supplying the metalworking industry with the fullest possible information on the latest developments in machine tools, and particularly so since they will be denied the advantage of the Machine Tool Show.

STEEL

PENTON BUILDING · CLEVELAND

STEEL
PRODUCTION · PROCESSING · DISTRIBUTION · USE
J&L STRIP AND SHEETS GIVE YOU FAST PRODUCTION AT LOW COST
JONES & LAUGHLIN STEEL CORPORATION
J&L STEEL

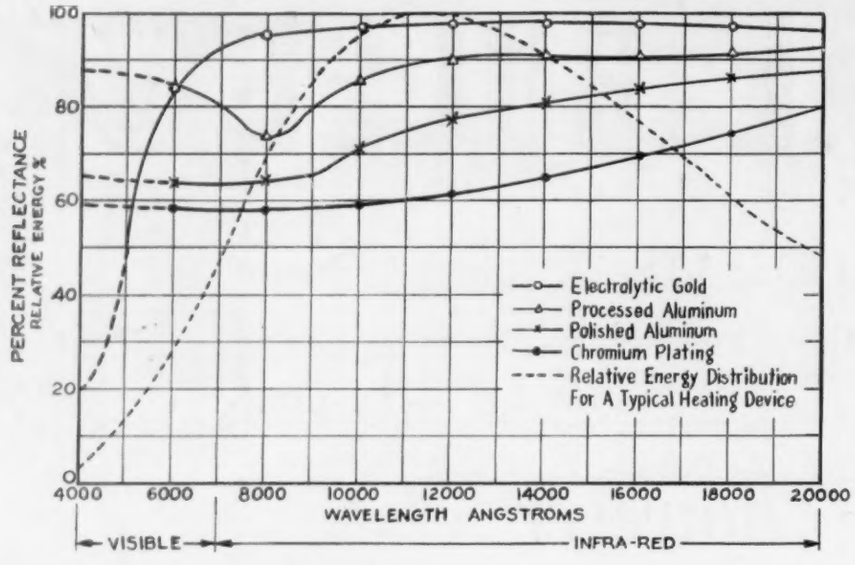


Fig. 2—Reflectance curves for various metals. These indicate the extremely high reflectance values of the electrolytic gold surface at wavelengths of 7000 Angstrom units and longer

highly polished, easy to maintain and resistant to corrosion by gases which are apt to be present in the locality of the lamp bank where paints, lacquers and the like are being dried. Escaping volatiles may fog the reflectors and reduce their efficiency, but the film thus formed may be cleaned off without depreciating the gold plate, using the following procedure:

Dip the reflectors in a warm solution (150 degrees Fahr.) consisting of 2 ounces of trisodium phosphate to each gallon of water. Rinse and dip in a 4 per cent solution of hydrochloric acid. Then rinse and dry.

Reflectors Staggered

In some cases it may be desirable to precede the above process by spraying or dipping the reflectors in the thinner for the type of finish being dried. Abrasive cleaners are not recommended since they cause excessive depreciation of the gold plate, although jewelers' rouge may be used if necessary where suitable thinners are not available.

The most effective heat distribution pattern is obtained with a staggered arrangement of reflectors and since seven units is the smallest number from which a representative pattern may be obtained, field experimental work should be conducted with this or a larger number of units, depending on the volume of heat required.

At present, two standard size reflectors are available, 9-inch and 12-inch diameters, for delivering heat densities to the working surface of one watt per sqare inch or greater, depending upon whether a single, plain or converging arrangement of the reflectors is used. The physical temperature which the work may attain is largely dependent upon its own ability to absorb the heat, although the majority of present-day applications range from 150 to 500 degrees Fahr. The lower limit is representative of installations for ordinary air-dry finishes, while the upper limit is desirable for the proper curing of modern synthetic enamels.

Keep Heat In Work

Reflectors should be located from 12 to 18 inches from the working surface and no enclosure need be used unless it is desirable to conserve the convected energy, in which case facilities should be provided to keep atmospheric humidity suitably below the saturation point for any volatiles which the radiant energy may be intended to drive off. Care must be taken to prevent undue convection or conduction of heat from the work. Movement of the work with respect to the heat sources is most desirable.

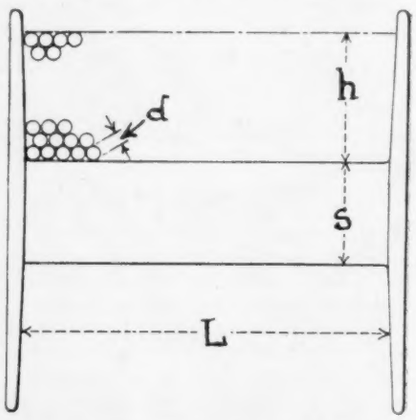
The question arises: How much of the energy input to the radiant heat source or incandescent bulb is it possible to realize in effective heat at the surface of the work being treated? Engineers of the Hall company state that about 88 per cent of the power input to the source is converted into radiant heat, and a good installation will permit recovery of 65 per cent of the available heat at the working surface. Thus, the overall efficiency would appear to be about 57 per cent, which is high for heat transfer.

As with any new method, different installations may require different treatment. Hence the Hall company has set up a staff to consult with prospective users of radiant heat and is prepared to give users the benefit of experience in prior installations.

Shortcut Tells Length Of Cable Wound on Reel

■ Often it is desired to determine quickly the total length of rope, cable, wire or hose on a drum or reel. The following method may be found helpful. Material on the drum naturally assumes a position indicated in the accompanying sketch with turns of succeeding layers tending to fall between turns of the previous layers. In this manner, maximum length is wound onto the drum.

To determine total length, four measurements are necessary: Depth of material on drum, diameter of drum, length of drum, diameter of rope or wire. To the depth of the rope or cable, "h," add "s," the diameter of the drum. Multiply this by the depth, "h," and the result by the inside length of the drum, "L." If this then is divided by the square of the diameter of the rope or cable and multiplied by 0.3, the result is



The four measurements shown here are all that is required to figure total cable length by the shortcut described

the length. Use all dimensions in inches and the result will be in feet.

For example, consider a drum in which h = 10 inches, s = 20 inches, L = 50 inches and diameter of cable is ½-inch. How many feet on the drum? Applying the above shortcut gives total length of 18,000 feet. This simple set of calculations thus is a real timesaver.

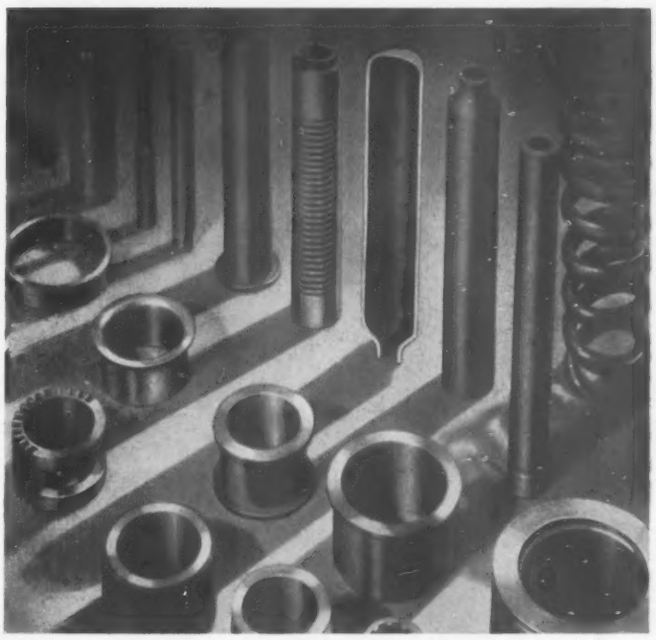
Practice Reaffirmed

■ Simplified practice division, national bureau of standards, Washington, has announced that simplified practice recommendation R115-30 covering full disk buffing wheels has been reaffirmed without change by the standing committee of the industry. The recommendation, which establishes a simplified list of standard diameters for 20-ply buffing wheels became effective in 1930 and was reaffirmed in 1936 and 1937.

Pittsburgh Steel Tubing

A short-cut to lower costs

IN JOBS LIKE THESE . . . YOUR PRODUCT IS HALF DONE BEFORE IT'S BEGUN!



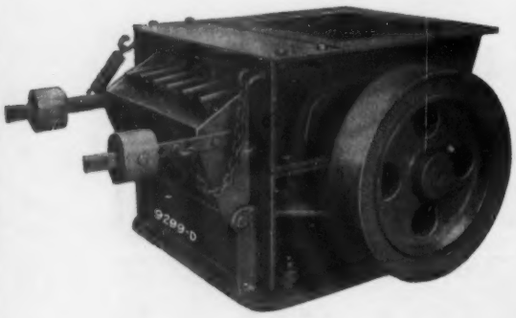
From draftsmen to machinists, the men responsible for your production can agree on *one* thing . . . Pittsburgh Steel Mechanical Tubing reduces machining and other operations to a minumum. The experience of *Pittsburgh* engineers in adapting tubing in a wide range of sizes, analyses and finishes to manufacturing problems is yours for the asking. Send us your blueprints for analysis and recommendation, without obligation.

Pittsburgh Seamless STEEL MECHANICAL TUBING

PITTSBURGH STEEL COMPANY
1653 GRANT BUILDING · PITTSBURGH, PA.
New York Detroit Chicago Cleveland Memphis Houston Los Angeles

Crusher Sizes Material

■ Stephens-Adamson Mfg. Co., Aurora, Ill., has developed ring-type crushers with triangular-shaped manganese steel sectors operating so as to crack lumps rather than

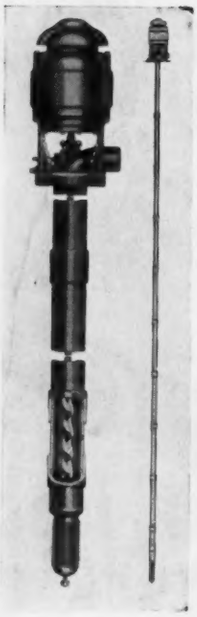


crush them, minimizing pulverizing to reduce the volume of fines. Line handles all types of bulk materials from 6 to 36 inches in size such as coal, peat, glass, limestone, steel turnings, salt, coke, garbage and gravel.

Air Motored Mixer

■ Eclipse Air Brush Co. Inc., Newark, N. J., has developed the AB small mixer for use on 5-gallon batches. Unit has variable speeds through air intake control (30 to 6000 revolutions per minute) and may be used on flammable materials such as varnish, lacquer, gasoline, high explosives, etc. Air throttle control of speed makes it particularly useful on jobs where viscosity of material changes during mixing. Mixer is standard with ⅜-inch chromium-plated or stainless steel shaft 12 inches long and one 3-inch triple blade chromium-plated bronze or stainless steel propeller.

Deep-Well Pump



■ Peerless Pump division of Food Machinery Corp., 301 West avenue 26, Los Angeles, has developed Hi-Lift pumps operating at 1760 revolutions per minute and obtaining maximum capacity from small-drilled deep wells as small as 3 inches in diameter with lifts ranging from 40 to 1000 feet with little variation in capacity or pressure. Capacities start at 5 gallons per minute, and pressures in excess of 500 pounds are obtainable.

Constant Level Oiler

■ Trico Fuse Mfg. Co., 2948 North Fifth street, Milwaukee, announces visible automatic constant level oilers with unbreakable reservoirs. Unit automatically maintains proper oil level in ring or ball bearings, gear and pump housings, etc. Reinforcing ribs give added strength, streamlined appearance and offer good grip when handled. Reservoir is attached to lower casting by threaded spout. Oiler is made in 1, 2, 4 and 8-ounce capacities.

Type Holder

■ A self-contained locking pin that carries its own spring for holding the type is a feature of the Markwell type-holder body offered by Pittsburgh Stencil & Tool Co., 405 Penn avenue, Pittsburgh. This holder is strong enough for marking steel billets and yet light enough for numbering tools and the like. Holders are made to be held in a machine or in the hand while they are struck with a hammer and can be made for any number and size of characters. Ax, double-ax, hammer and inspector's hammer styles are available.

Welders' Glove Has One-Piece-Leather Back

■ A one-piece-back welders' glove has recently been added to its line of industrial safety clothing by the Industrial Gloves Co., Danville, Ill. This glove, Safeguard No. 13475, has

entire back made from one solid piece of leather, thus eliminating seams. Extra wide leather strap protects and reinforces the thumb seam, and all other seams at points of greatest wear are welted for extra reinforcement. A wool heat-breaker is securely sewed to the back of the glove, inside, to provide insulation against heat. Entire glove is shrink-proof heat-resistant leather of special tannage. It can be supplied in all lefts or all rights, or in any combination of lefts and rights.

Vertical Milling Machine

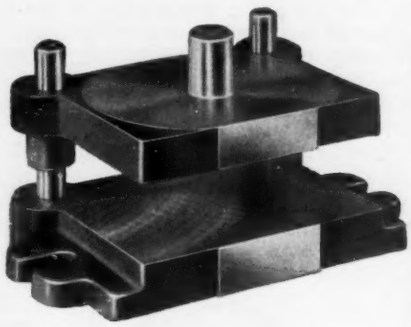
■ Linley Bros. Co., Bridgeport, Conn., has developed high speed vertical milling machine and jig borer with micrometer screw feed quill. Screws are of chrome nickel steel and have ten accurately machined threads per inch running in burnished replaceable bronze nuts. Dials are of 2½-inch diameter with 100 one thousandth-inch markings. Standard ½-inch tee slot runs full length of table. Spindle nose is not

ADVERTISING PAGES REMOVED

machined with tapered hole but to take collets up to and including ½-inch capacity. Special collet is furnished to take No. 5 B & S or No. 1 Morse taper shank. Feed is through ten-pitch screw running parallel to and solidly attached to quill flange at its upper end. Unit has eight spindle speeds. Table is 5½ x 14½ inches, travels 10 inches longitudinally and 5 inches crosswise.

Precision Die Set

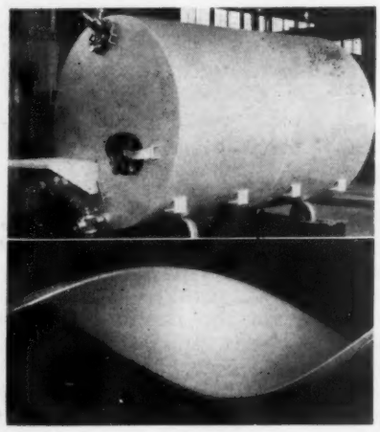
■ Danly Machine Specialties, Inc., 2130 South Fifty-Second avenue, Chicago, announces a new and enlarged line of precision die sets in a wide range of sizes of regular, reverse and long narrow die sets for any die from 3 x 3 to 14 x 14



inches. These die sets are assembled with precision guide posts which are hardened, ground and lapped to tolerances of plus or minus 0.0001-inch and bushings of standard, shoulder and extra long types ground and honed to the same limits. Die or punch holders of the same center distance are interchangeable.

Clad Stainless Steel

■ Stainless clad steel sheets and plates, known as Silver-Ply, which combine the corrosion resistance of



stainless steel with many of the desirable properties of mild steel, have been placed on the market by Jessop Steel Co., Washington, Pa. They are suitable for cooking vessels, storage tanks and other equipment used in the processing and handling of varnish, chemicals, soaps, oil and gas, etc. It is claimed Silver-Ply may be bent, spun into deep heads, deep drawn, drilled and otherwise worked with greater ease than solid stainless and is not subject to "hot spots." The weld between the stainless cladding and the mild steel backing is strong, uniform and oxide-free. In the lower part of the accompanying illustration, a strip of Silver-Ply is shown twisted into a spiral without any separation of the composite metals. The usual sheets or plates of this material consist of 20 per cent stainless steel and the remainder mild steel of flange quality; but all degrees of cladding from 3 to 50 per cent also have been successfully produced.

Weight Calculator

■ Kropp Forge Co., 5301 West Roosevelt road, Chicago, is distributing a calculator for rapidly determining the weights of forged square, round, hexagonal and octagonal flats and bars and forged rings and blanks. No computation is neces-

Handling FERROMANGANESE from cars to stock pile this Blaw-Knox Bucket unloads an average of 7 cars per eight hour shift. The former cost of $.65 per ton was *reduced* to $.25 per ton.

This bucket handles LIMESTONE in pieces ranging from 6" to 12" from dock to 50-60 ton gondola, filling car in an average time of 20 minutes.

It unloads SPIEGEL from 50-60 ton car in 1½ hours without teeth, and handles PIG IRON from stock pile at the rate of about ¾ Cu. Yds. per grab.

Blaw-Knox Buckets are designed to meet Steel Mill requirements—put your bucket problems up to Blaw-Knox.

BLAW-KNOX
Digging and Rehandling
BUCKETS
BLAW-KNOX DIVISION
• OF BLAW-KNOX CO. •
Farmers Bank Bldg. · Pittsburgh, Pa.

sary. It is only necessary to know the dimensions of any of the forged shapes covered by the calculator to determine instantly its weight. These devices are available at a small charge to partially cover cost of producing and mailing.

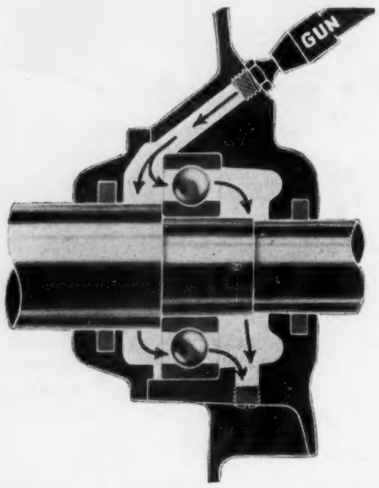
3 in 1 Face Shield

■ Boyer-Campbell Co., 6540 St. Antoine street, Detroit, announces a 3 in 1 face shield having screen, fiber or "plastacele" guards which are interchangeable and may be buttoned on at option. Fitted with plastacele window, shield is suitable for spot, flash and gun welding, buffing, polishing, etc. When fitted with wire screen window, it is recommended

for use in babbitting, heat protection, etc. Fiber front and glass holder give the wearer complete protection for acetylene welding, burning, scarfing, etc. The windows are buttoned on the spark deflector (fiber forehead guard) and absorbent leather sweatbands, backed by wool felt, keep perspiration out of the eyes. Plastacele windows are aluminum bound to permit fitting to suit the wearer with or without prescription glasses and when not in use can be tilted upward to protect wearer from overhead glare.

Lubrication System For Electric Motors

■ U. S. Electrical Motors, Inc., 200 East Slauson avenue, Los Angeles, has developed the U. S. Lubriflush system of lubricating electric motor ball bearings which will be applied to all motors made by the company. In this system a drain plug is provided on the opposite side of the ball bearing from the filling plug. As new grease is injected into the bearing chamber, the old is forced out through the drain plug. By watching grease emitted, maintenance man

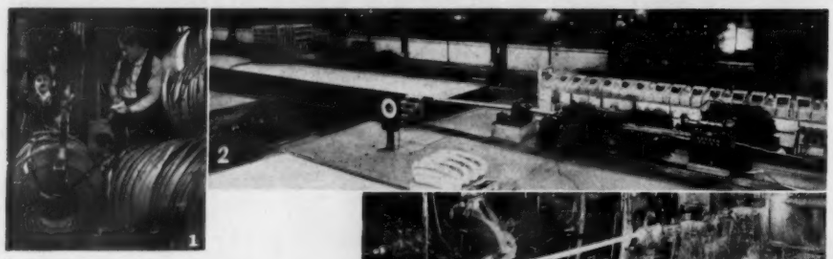


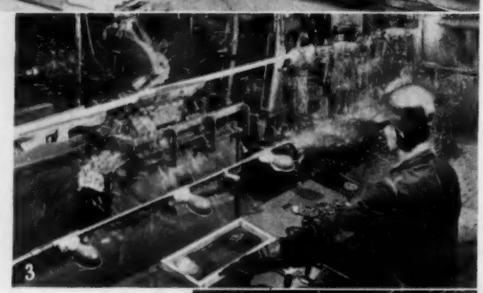
can tell when grease has been completely renewed. To eliminate the possibility of too much grease around the bearing, the motor is run for a few minutes with the drain plug removed to allow excess grease to drain out. It is claimed the remaining grease will not overheat bearings under continuous operation.

Chase Holders

■ Jones & Lamson Machine Co., Springfield, Vt., announces that new chaser holders are now available for the Model 22 tangent die-head. These will increase the capacity of this die and make it versatile when used on hand screw machines and turret lathes where the job changes are frequent and a die with a large threading range is required. The Model 22 Jones & Lamson tangent die can now be furnished with chaser holders ¼ to ¾-inch capacity

Complete PIPE MAKING Equipment
from Skelp to the finished pipe—



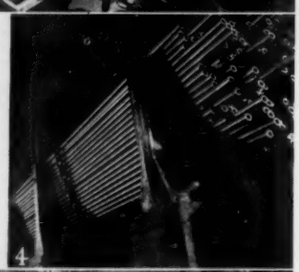


If you are in business to MAKE PIPE you will be interested in what "Salem" has to offer.

Three complete plants similar to that Illustrated are now in the process of being designed and installed by Salem Engineering Company.

"Salem" is well-equipped —with actual experience —to supply and install every piece of equipment from the skelp handling crane to the finished pipe at any point on the finishing floor.

1 Flat skelp before being made into pipe
2 Skelp enteringcharging end of heating furnace
3 Skelp eaving furnace, entering mill and being cut to length by hot saw
4 The finished product
5 Batch type billet heating furnace for heating billets before piercing



For revisions to present mills, may we offer you our rotary hearth or batch type billet heating furnaces (illustration No. 5), tube reheating furnaces, and annealing and drawing furnace equipment.

"Salem's" Newest Pipe Annealing Installation is A TUBULAR FURNACE FOR TUBULAR PRODUCTS
Watch for it in Future Ads

SALEM, OHIO

CHICAGO — DETROIT — PITTSBURGH — NEW YORK
LONDON — PARIS — BERLIN — WELLAND, ONT

SALEM ENGINEERING COMPANY

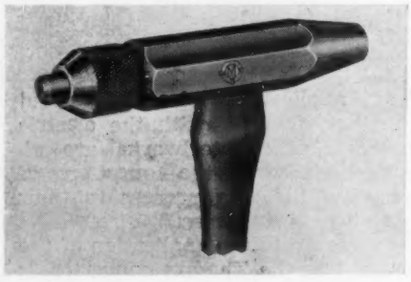
(these holders take the standard Model 21 die chasers) and with chaser holders of ¾ to 1¼ inches capacity. Each set of holders will accommodate any diameter and pitch thread within the capacity of the die. Chaser holders with a capacity of 1⅛ to 1½ inches also are available for use with this same die. All chasers are ground in the thread form after hardening.

Castable Refractory

■ The A. P. Green Fire Brick Co., Mexico, Mo., announces a new insulating castable refractory known as Kast-O-Lite. This new mix and pour refractory has been developed to combine insulating properties with all the advantages of castable refractories. Kast-O-Lite has a temperature resistance of 2500 degrees Fahr., and may be used in direct contact with flame up to this temperature. This light weight material matures without the application of heat and may be put into service in from 12 to 24 hours. A few uses of Kast-O-Lite include combustion chambers, door linings, special insulating refractory shapes, heat shields, baffles for domestic stokers and top decks of water tube boilers.

Marking Hammer

■ An inspector's hammer designated as RR-1 and entirely new in that the steel type is held in the hammer by means of a rubber retaining ring is anncunced by Jas. H. Matthews & Co., 3942 Forbes street, Pittsburgh. The rubber ring inside the knurled segment which screws on the end of the hammer is made of very tough and durable synthetic rubber and eliminates the pins, clips, set screws and springs used in other hammers. To change type, the knurled segment is loosened, type



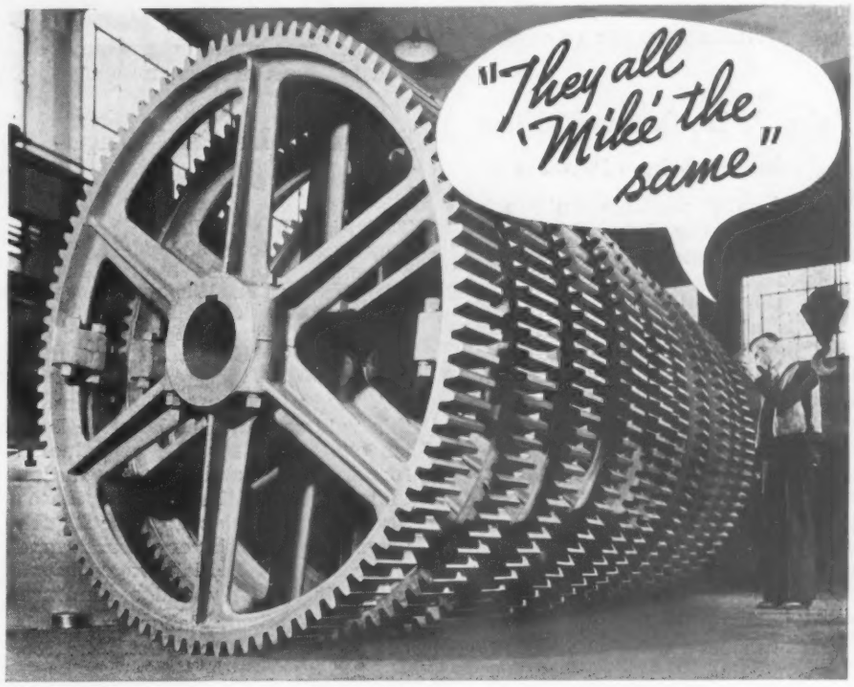
is replaced. Steel type can be made from 3/64-inch up in "sharp face" for marking metal products and side grain of wood, or "flat face" for marking wood, fibre or other products of soft materials, in one or more characters including inspector's initials, code symbols or trade mark design. Hammer can be made to hold type on one or both ends and handle is hickory of any length desired.

Drills Redesigned

■ The redesigning of five of their drills has been done by Black & Decker Mfg. Co., Towson, Md. These are the ½-inch utility, the ⅜-inch heavy duty, the ¾-inch utility, the 5/16-inch heavy duty and the ¼-inch heavy duty drills. The improved drills are shorter and lighter and on each the spindle offset has been reduced to a minimum.

Tapping Compound Lubricates Threads

■ "Dag" colloidal graphite suspended in mineral oils has been found to be an excellent cutting compound for tapping operations, particularly in castings and forgings of aluminum and similar alloys, according to Acheson Colloids Corp., Port Huron, Mich. The compound is claimed to provide extremely free cutting action and longer tap life, probably due to the lubricating properties of the colloidal graphite adhering to the threads.



960 GEAR TEETH . . . ALL ALIKE

☆ The tooth vernier on the finished product tells the story of exceptional accuracy . . . one pattern . . . ten large gears . . . nine hundred and sixty teeth . . . each one exactly like the other. ☆ Whether it's a spur gear or some other type . . . there's a Horsburgh & Scott standardized gear for the job . . . accurate . . . husky . . . built to endure. Unceasing vigilance in the selection of materials and painstaking care in design and manufacture make H & S Gears the finest in the world. You'll find proof in their trial.

Your Company Letterhead Brings a Complete 448-Page Catalog

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

Conveyor Mountings

(*Concluded from Page 50*)

provided for by varying the length of the mountings used. For belts 48 to 60 inches wide, 4-inch long mountings are usually sufficient for light impact; 6-inch mountings can take care of fairly heavy impact. For extremely severe conditions, an 8-inch long mounting may be used. On narrower belts, shorter mountings are used.

Where a bad oil or grease condition is encountered, a protective metal shield can be inserted between the idler channel and the face bar of the mounting which will supply adequate protection for the rubber.

Take A Look At Milling

(*Concluded from Page 37*)

milling with multiple cutters as practiced in the automobile industry. This photograph was taken on the production line out of which came the Studebaker Champions. This is a special Ingersoll milling machine which at one pass machines the manifold face, oil pump, distributor, oil relief and angular pads on both sides of these Champion cylinder blocks—at a rate as high as 32 blocks per hour. This machine is equipped with several independent driving motors and is designed so that the work passes through from one roller conveyor to another, thus eliminating lifting and other heavy handling.

The machine shown in Fig. 3 is one of two Cincinnati duplex hydromatic milling machines used by a well known diesel engine manufacturer on large connecting rods. Under an older system of machining, 83 minutes was required to rough and finish both faces of the two ends of these connecting rods, which are 3 feet 2 inches in length. With the new machine set up as shown, the job is done in 21 minutes—floor to floor.

Here is a highly enlightening commentary on the economic significance of modern machine tools. Within eleven months the actual cash savings attained through the use of the two new machines just mentioned amounted to $3000 which is 12 per cent of the price which was paid for these modern millers.

Explains British Wage-Fixing Procedure

■ *British Wages Boards,* by Dorothy Sells; cloth, 389 pages, 5½ x 8 inches; published by the Brookings Institution, Washington; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

A study in industrial democracy, this volume indicates how the British experience may be of value in forming wage and hour legislation and administration in the United States. It explains how the British wage-fixing machinery works and the results of British wages board action in industry and agriculture.

Since the fair labor standards act went into effect Oct. 24, 1938, the United States assumes a place among nations adopting legislation of this general type. In view of the complexity of the task involved in this new phase of government activity the experience of Great Britain may prove of value.

It seems reasonable to suppose that out of the broad experience of other countries in dealing with minimum wage legislation certain principles, methods and expedients have been developed and some illuminating mistakes made which should afford guidance for similar undertakings elsewhere.

Stainless Steel Lumber

(*Concluded from Page 41*)

merely been touched. Dozens of miscellaneous uses can be expected to develop rapidly such as for table tops and other furniture parts and similar adaptations. A factor here is the ability of the Bord to be stamped readily to special shapes, since the metal cuts with a beveled edge requiring no further treatment.

As a product, Ludlite Bord is the exclusive development of the company. Both the backing element and the finished product are protected under United States patents Nos. 1,995,412 and 2,041,041. The manufacturing process is protected under patent No. 2,066,550. Foreign patents are either ready for issuance or pending.

Marketing plans have been worked out so the Bord will be available to industrial consumers, architects, builders and contractors through either Allegheny Ludlum's own district sales offices and warehouses or those of selected distributors. Complete stocks of both the flexible Ludlite and the rigid panels will be maintained in every important city. In the case of the Bord, established practice will call for shipment in crates of eight ⅛-inch panels or four ¼-inch panels.

Clean Steel

(*Concluded from Page 45*)

from applications already realized in other quarters with the electric furnace, other steelworks are already studying the question of adapting the slag process to their open-hearth furnaces.

In regard to the application of the process to the Thomas converter, it has already been possible by this means to manufacture steels of a grade similar to that of open-hearth steel, and the question of manufacturing high-quality steels by means of the converter is now being actively investigated, but a few more months will be necessary before results can be given with any certainty.

Steel Markets Hit By Rush of Orders

Export Inquiries Gain; Operations Poised For Sharp Rise

MARKET IN TABLOID ★

Demand
Up markedly as buyers seek forward coverage.

Prices
Strong; export quotations advance; scrap higher.

Production
Off 2 points last week to 62 because of holiday.

■ STEEL buyers have responded to the outbreak of war with a heavy rush of orders.

Ingot production has snapped back promptly from the holiday letdown early last week. Scheduled gains this week, ranging up to 10 points or more in a number of leading districts, will push the national steelmaking rate to a new high for the year to date. Mills are heavily booked on many products into October.

Scrap prices are stronger in most areas, and STEEL'S price composite is up 29 cents to $15.79, highest in nearly two years.

Movement of iron ore over the Great Lakes is being speeded, with an additional 25 carriers expected to be placed in commission before the end of September.

The flood of inquiries and orders for practically all steel products is the result of several circumstances. Primarily it reflects relatively good prospects for domestic consumption the remainder of the year and buyers' fears of higher prices. Attractiveness today of prices at which large lots of sheets and strip were placed last spring has prompted heavy specifying against such contracts before their expiration. Similarly, bar demand has been stimulated by approaching application of higher extras.

Foreign Inquiries Increase More Rapidly Than Orders

Export inquiries also have been swelled sharply by the European situation, as many neutral countries must seek new sources of supply. So far, however, little foreign business has been placed. A complicating factor in export trade is the current scarcity of available ships. Export prices on steel products have stiffened markedly, but in most instances continue under domestic levels.

Steelmakers have refused to be stampeded by the abrupt increase in demand, and for the first time in many months are selecting tonnage. Considerable business offered at current prices for future delivery has been turned down. The policy on forward buying has been to quote on the basis of the price prevailing at time of shipment, but in some cases this is being limited to regular customers.

Indications point to higher steel prices before the end of the year, but the industry is not inclined to take advantage of the present confused situation by instituting large advances that would tend to arrest domestic recovery. In view of the likelihood of higher production costs through advancing prices on various raw materials, steel quotations over coming months are expected to be subject to more frequent revisions than in the past, when quarterly adjustments usually sufficed.

Tin Plate Producers Accept Business at Current Prices

Tin plate producers have advised customers fourth quarter business will be accepted at current prices, but the door has been left open for changes later in the year should conditions warrant them. Tin plate production still is declining seasonally, but the outlook for increased export demand is promising.

Some pig iron producers without formal announcement also are taking orders at present prices for fourth quarter delivery.

Railroads show more interest in steel requirements for equipment repairs. The carriers have improved prospects for a sizable increase in freight movement this fall, which, in turn, enhances the outlook for car building.

Equipment orders include 150 subway cars for New York. The Milwaukee road is expected to build 1000 to 2000 freight cars, the Burlington is planning construction of 1000 units and the Erie is inquiring for 1000.

Steelmaking averaged 62 per cent last week, the 2-point drop resulting from the holiday interruption. This compares with 41½ per cent a year ago. Exceptions to the downward trend were eastern Pennsylvania, up 2 points to 46; Detroit, up 9 points to 99; and Youngstown, up 1 point to 57.

Pittsburgh operations declined 4 points to 55, but are expected to rebound to 65 this week. Other reductions included 3 points to 51 at Chicago, 6 points to 80 at Wheeling; 5 points to 70 at Birmingham; 1½ points to 62 at St. Louis; 12 points to 68 at Cleveland; and 9 points to 57 at Cincinnati. Unchanged were Buffalo at 60½ and New England at 70.

COMPOSITE MARKET AVERAGES

	Sept. 9	Sept. 2	Aug. 26	One Month Ago Aug., 1939	Three Months Ago June, 1939	One Year Ago Sept., 1938	Five Years Ago Sept., 1934
Iron and Steel	$36.01	$35.98	$35.98	$35.95	$35.69	$36.48	$32.15
Finished Steel	55.60	55.60	55.60	55.60	55.70	57.20	54.00
Steelworks Scrap..	15.79	15.50	15.50	15.30	14.49	14.23	9.45

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week: Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 9, 1939	Aug. 1939	June 1939	Sept. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.25
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.05	2.05	2.05	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.40	2.45	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	Sept. 9, 1939	Aug. 1939	June 1939	Sept. 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$21.34
Basic, Valley	20.50	20.50	20.50	19.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	21.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	21.21
No. 2, foundry, Chicago	21.00	21.00	21.00	20.00
Southern No. 2, Birmingham	17.38	17.38	17.38	16.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	19.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	22.215
Malleable, Valley	21.00	21.00	21.00	20.00
Malleable, Chicago	21.00	21.00	21.00	20.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	28.34
Gray forge, del. Pittsburgh	21.17	21.17	21.17	20.17
Ferromanganese, del. Pittsburgh	85.33	85.33	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh	$16.75	$16.15	$15.00	$15.25
Heavy melt. steel, No. 2, E. Pa.	15.00	14.375	13.125	12.75
Heavy melting steel, Chicago	13.75	13.75	13.55	13.60
Rails for rolling, Chicago	17.75	17.75	17.75	17.75
Railroad steel specialties, Chicago	15.50	15.50	15.50	16.60

Coke

Connellsville, furnace, ovens	$3.75	$3.75	$3.75	$3.75
Connellsville, foundry, ovens	5.00	5.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 20 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(Base, 15 tons or over)

Pittsburgh	2.00c
Chicago or Gary	2.00c
Detroit, delivered	2.10c
Cleveland	2.00c

Buffalo	2.00c
Birmingham	2.00c
Gulf ports	2.35c
Pacific Coast points	2.60c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.80c
Gulf ports	2.15c
Pacific Coast ports	2.25c

**Base prices 20 cents less per 100 lbs. on billet bars, 15 cents less on rail steel, in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.40
Cement coated nails	$2.40
(Per pound)	
Polished fence staples	2.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.74; two-point cattle, 80-rod spool	2.58
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	57.00
Single loop bale tie, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carloads, Pittsburgh $3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 3 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.95c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller ... 67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago ... 3.40c

⅞-inch and smaller, 11 and 12 ..... 63½ 54

Pitts., Chi., Cleve. ..65-10 off

Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

⅛	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	.....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	$ 7.82	$ 9.01
1¼" O.D.	13	9.26	10.67
1½" O.D.	13	10.23	11.79
1¾" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼" O.D.	13	14.54	16.76
2¼" O.D.	12	16.01	18.45
2½" O.D.	12	17.54	20.21
2¾" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B

Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birmingham	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	...
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur	20.50	do., del. Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$21.00-21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	18.00
Do. barge	19.00
No. 2 lump	18.00-19.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.00
Do, smaller lots 2.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c

88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.61	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.40	4.60	4.50	3.51	4.09	8.59	7.19
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	4.55	4.28	3.51	4.06	8.56	7.16
Baltimore	3.70	3.85	3.80	3.55	3.55	5.00	3.55	4.90	5.05	....	4.05	....	....
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.40	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.50	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62	3.20	3.75	8.15	6.75
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.25	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.38	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.54	4.64	4.64	4.41	4.41	6.01	4.32	....	5.39	....	4.79	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60	5.00	5.10	....	....
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	.	5.25	....	.	....	....
Seattle	3.65	3.85	5.20	3.40	3.50	5.25	3.70	6.50	4.75	....	5.60	....	....
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75	....	5.85	....	....
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.00	4.45	6.00	10.40	9.55
San Francisco	3.50	3.90	6.00	3.45	3.45	5.05	3.45	6.40	5.15	....	6.55	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	3.85	7.31	5.86	5.61	7.71
Baltimore	3.85	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.38	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.65	....	7.80	7.65	8.45
Portland, Oreg.	5.70	....	7.80	7.65	8.50
Los Angeles	4.65	9.40	8.55	8.40	9.05
San Francisco	4.50	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 0-299 pounds (hoops only) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Pittsburgh; 1-9 bundles in Baltimore, Norfolk; 1-6 bundles in Los Angeles; 300-4999 pounds in Portland, Seattle, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Chicago, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1000 pounds and over, except 0-299 pounds in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999 pounds in San Francisco; 0-1999 in Portland.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Sept. 7

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$20.30 5 0 0	$18.32	2 3 0
Basic bessemer	.....	19.59	2 6 0
Hematite, Phos. .03-.05	21.31 5 5 0*	.....	.....
Billets	$29.94 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	46.18 11 7 6	43.67	5 2 6
Standard rails	$38.57 9 10 0	$48.99	5 15 0
Merchant bars	1.99c 11 0 0	1.81c to 1.90c	4 15 0 to 5 0 0
Structural shapes	1.81c 10 0 0	1.76c to 1.81c	4 12 6 to 4 15 0
Plates, †¼ in. or 5 mm.	1.97c 10 18 9	2.14c to 2.33c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm	2.35c 13 0 0	2.90c	7 12 6*
Sheets, gal., 24 ga., corr.	2.85c 15 15 0	3.47c	9 2 6
Bands and strips	2.21c 12 5 0	1.90c to 1.92c	5 0 0 to 5 1 0
Plain wire, base	3.52c 19 10 0	2.33c to 2.66c	6 2 6 to 7 0 0
Galvanized wire, base	4.25c 23 5 0	2.99c	7 17 6
Wire nails, base	.....	2.66c to 2.76c	7 0 0 to 7 5 0
Tin plate, box 108 lbs.	$ 4.18 1 0 3	.....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$22.09	4 19 0(a)	$15.75	679.30	$18.81	550	$25.20 63
Basic bess. pig iron	18.77	4 12 6(a)	.....	....	.....	...	27.80 (b) 69.50
Furnace coke	4.66	1 4 2	4.92	225	6.91	202	7.60 19
Billets	29.94	7 7 6	23.87	1,029	29.41	860	38.60 96.50
Standard rails	1.72c	9 10 0	1.47c	1,405	2.20c	1,375	2.38c 132
Merchant bars	2.09c	11 12 0††	1.36c	1,304	1.76c	1,100	1.98c 110
Structural shapes	1.88c	10 8 0††	1.32c	1,268	1.76c	1,100	1.93c 107
Plates, †¼-in. or 5 mm	1.98c	10 19 3††	1.73c	1,650	2.20c	1,375	2.29c 127
Sheets, black	2.64c	14 15 0	2.05c	1,958‡	2.52c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.12c	17 5 0	3.09c	2,850	4.32c	2,700	6.66c 370
Plain wire	3.52c	19 10 0	2.10c	2,000	2.64c	1,650	3.11c 173
Bands and strips	2.23c	12 7 0††	1.51c	1,444	2.08c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted, due to war interruption.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	14.00-14.50
New Eng. del. No. 1	14.00-14.50
Buffalo, No. 1	15.50-16.00
Buffalo, No. 2	13.00-13.50
Chicago, No. 1	13.50-14.00
Chicago, auto, no alloy	12.50-13.00
Chicago, No. 2 auto	10.50-11.00
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	11.00-11.50
Detroit, No. 2	10.00-10.50
Eastern Pa., No. 1	17.00-17.50
Eastern Pa., No. 2	15.00
Federal, Ill.	11.50-12.00
Granite City, R. R.	12.00-12.50
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	12.50-13.00
Los Angeles, No. 2	11.50-12.00
L. A., No. 1 f.a.s.	15.00-16.00
L. A., No. 2 f.a.s.	14.00-15.00
N. Y. dock No. 1 exp.	13.00
Pitts., No. 1 (R. R.)	17.00-17.50
Pittsburgh, No. 1	16.50-17.00
Pittsburgh, No. 2	14.50-15.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	12.50-13.00
San Francisco No. 2	11.50-12.00
Seattle, No. 1	11.00-12.00
Toronto, dirs. No. 1	9.25- 9.75
Valleys, No. 1	15.00-15.50

COMPRESSED SHEETS

Chicago, factory	13.00-13.50
Chicago, dealers	11.50-12.00
Cincinnati, dealers	11.00-12.00
Cleveland	14.00-14.50
Detroit	12.50-13.00
E. Pa., new mat.	17.00
E. Pa., old mat.	14.00-14.50
Los Angeles	11.00-11.50
Pittsburgh	16.50-17.00
St. Louis	9.25- 9.75
San Francisco	11.00-11.50
Valleys	14.75-15.25

BUNDLED SHEETS

Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	11.50-12.00
Cleveland	10.75-11.25
Los Angeles	14.00
Pittsburgh	14.50-15.00
St. Louis	8.50- 9.00
Toronto, dealers	8.00- 8.50

SHEET CLIPPINGS, LOOSE

Chicago	8.50- 9.00
Cincinnati, dealers	7.00- 7.50
Detroit	9.00- 9.50
†Los Angeles	3.75- 4.00
St. Louis	7.50- 8.00
Toronto, dealers	4.25- 4.75

BUSHELING

Buffalo, No. 1	13.00-13.50
Chicago, No. 1	12.50-13.00
Cincin., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	2.25- 2.75
Cleveland, No. 2	8.25- 8.75
Detroit, No. 1, new	11.25-11.75
Valleys, new, No. 1	14.75-15.25
Toronto, dealers	3.75- 4.25

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	8.50- 9.00
Chicago	7.00- 7.50
Cincinnati, dealers	4.50- 5.00
Cleveland, no alloy	7.50- 8.00
Detroit	6.00- 6.50
Eastern Pa.	10.50-11.00
Los Angeles	5.00
New York	†3.50- 4.00
Pittsburgh	10.50-11.00
St. Louis	4.50- 5.00
San Francisco	5.00
Toronto, dealers	4.25- 4.75
Valleys	9.50-10.00

SHOVELING TURNINGS

Buffalo	9.50-10.00
Cleveland	8.75- 9.00
Chicago	7.00- 7.50
Chicago, spcl. anal.	8.00- 8.50
Detroit	7.00- 7.50
Pitts., alloy-free	13.00-13.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.50
Buffalo	8.00- 8.50
Cincinnati, dealers	3.25- 3.75
Cleveland	8.50- 9.00
Eastern Pa.	6.50- 7.00
Detroit	6.00- 6.50
New York	†2.50- 3.00
Pittsburgh	9.25- 9.75
Toronto, dealers	3.50- 4.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	11.00-11.50
Chicago, elec. fur.	13.50-14.00
East. Pa. elec. fur.	14.50-15.00
St. Louis	9.00- 9.50
Toronto	4.00- 4.25

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†4.75
Buffalo	7.50- 8.00
Chicago	6.50- 7.00
Cincinnati, dealers	3.25- 3.75
Cleveland	8.50- 9.00
Detroit	6.00- 6.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	3.00- 3.50
Toronto, dealers	3.75- 4.25

RAILROAD SPECIALTIES

Chicago	15.25-15.75

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	13.50-14.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.00-16.50
Chicago, leaf	15.00-15.50
Eastern Pa.	18.50-19.00
Pittsburgh	20.00-20.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.50-18.00
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	17.50-18.00
Detroit	17.50-18.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	20.00-20.50
St. Louis, 2 ft. & less	16.50-17.00

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	13.50-14.00
Cleveland	16.50-17.00
Pittsburgh	18.00-18.50
St. Louis	14.50-15.00
Seattle	16.00

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	14.50-15.00

ARCH BARS, TRANSOMS

St. Louis	14.50-15.00

PIPE AND FLUES

Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.25- 6.75
Eastern Pa	14.00-14.50
New York	†8.50- 9.00
St. Louis	8.00- 8.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	17.50
St. Louis, No. 1	9.75-10.25
St. Louis, No. 2	12.00-12.50

FORGE FLASHINGS

Boston district	†8.50- 9.00
Buffalo	13.00-13.50
Cleveland	13.50-14.00
Detroit	10.50-11.00
Los Angeles	9.00
Pittsburgh	15.00-15.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.75-16.25

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	19.50-20.00
Pitts., billet, bloom, slab crops	21.00-21.50

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	16.00-16.50
Cleveland	15.00-15.50
Eastern Pa.	18.00-18.50
Pittsburgh	18.25-18.75
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†14.50-15.00
Eastern Pa.	18.00-18.50
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†14.50
Chicago, net	17.00-17.50
Eastern Pa.	20.50-21.00
St. Louis	17.00-17.50

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	13.00-13.50

SHAFTING

Boston district	†15.75-16.00
New York	†16.00-16.50
Eastern Pa.	22.00
St. Louis, 1¼-3¾".	15.50-16.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	13.50-14.00
Chicago, rolled steel	15.00-15.50
Cincin., iron, deal.	13.50-14.00
Eastern Pa., iron	17.00-17.50
Eastern Pa., steel	18.50-19.00
Pittsburgh, iron	16.00-16.50
Pittsburgh, steel	20.00-20.50
St. Louis, iron	14.75-15.25
St. Louis, iron	15.00-15.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†11.50-11.75
N. Eng. del. No. 2	13.00-13.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	9.50-10.00
Chicago, auto net	12.50-13.00
Chicago, railroad net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	12.75-13.25
Cleveland, mach.	17.50-18.00
Detroit, cupola, net	13.00-13.50
Eastern Pa., cupola	17.00-17.50
E. Pa., mixed yard	15.00
Los Angeles, net	13.00-13.50
Pittsburgh, cupola	15.50-16.00
San Francisco, del.	12.50-13.00
Seattle	12.50-13.50
St. Louis, cupola	13.00-13.50
St. Louis, agri. mach.	14.00-14.50
St. L., No. 1 mach.	15.00-15.50
San Francisco	12.50-13.00
Toronto, No. 1, mach., net	12.00-12.50

HEAVY CAST

Boston dist. break	†11.00-11.25
New England, del.	12.50-13.00
Buffalo, break.	11.50-12.00
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break	10.50-11.00
Eastern Pa.	17.00
Los Ang., auto, net.	13.50
New York, break	†12.00-13.00
Pittsburgh, break	13.00-13.50

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	11.50-12.00
Chicago, net	7.75-8.25
Cincinnati, dealers	6.25- 6.75
Detroit, net	7.00- 7.50
Eastern Pa.	14.00-14.50
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	6.50- 7.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	14.00-14.50
Chicago, R. R.	15.00-15.50
Cincin., agri., deal.	11.00-11.50
Cleveland, rail	16.50-17.00
Eastern Pa., R. R.	17.50
Los Angeles	15.00
Pittsburgh, rail	17.00-17.50
St. Louis, R. R.	12.50-13.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

(All prices nominal)

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	11.00
Tungsten, short ton unit, duty pd. nom.	18.50-19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	29.00
So. African, 50-52% nom.	29.00
Indian, 49-50%	27.00-28.00

—The Market Week—

Sheets, Strip

Sheet & Strip Prices, Page 68, 69

Pittsburgh—Mills are cautious in accepting new business which is being offered in heavy volume. The rush of buying has been prompted by expectations of higher prices and by the fear that export business may tie up productive capacity. The latter fear is unfounded so far, with sheet mills operating only about 60 per cent and strip output some 15 points less. The pickup in buying has been well distributed, with some fairly heavy automotive releases received for September shipment. Galvanized sheet production is steady at 64 per cent, but an increase is expected the next three weeks.

Cleveland — Relatively low inventories and fears of price advances have stimulated demand markedly. Producers have been offered substantial fourth quarter tonnages at the current market but have taken such business only subject to future prevailing prices. Heavy shipments are assured the remainder of September, in view of the approaching deadline for delivery against contracts placed last May.

New York — Sheet demand is broadening, with sellers refusing to quote deliveries beyond the end of this quarter excepting on a basis of prices ruling at time of delivery. A strong market is in prospect. About 1000 tons of heavy gage sheets for stair work will be required for housing projects at Corlears Hook and South Jamaica, Midwood high school Brooklyn and the Criminal Court building.

Sharp improvement has appeared in narrow cold strip buying. The combination of war, low inventories and possibility of higher prices are factors. Gains in consumption in no way match the sudden upturn in demand. More releases are coming from the automobile trade and efforts to build up inventories is general among a widely diversified number of users. Rerolling operations at some eastern plants have been raised to practically capacity.

Philadelphia — Several leading sheet sellers clamped a deadline the middle of last week on specifications against cheap contracts taken for the general trade last spring. Shipments in these cases are to be made by the end of this month or at mills' convenience. Some interests believe they will have these deliveries completed early in October.

Cincinnati — Sheet demand has reached 100 per cent of mill capacity, with increased consumption and expectations of higher prices prompting buyers to take heavy shipments

A FIRE SENTENCED TO DIE

In 3 Seconds!

Here's a sure-handed, dependable weapon against fire. It kills blazes with the fastest known extinguishing agent —carbon dioxide snow-and-gas. It spells sudden death to fire! It harms nothing but fire.

LUX extinguishers and LUX Built-In Systems are *engineered for industry*. LUX protects vital processes, costly and delicate equipment. Old-fashioned extinguishing methods are not good enough for industry. Industry wants the speed, precision and safety of LUX equipment.

Electrical and flammable liquid fires—industry's worst hazards—are no problem in a LUX-equipped plant. Send the coupon. Get the facts now.

Announcing Kidde-LUX

Easy one-handed operation and trigger action make this new Kidde-LUX Model Two a sensational success against smaller fires. Aim it . . . pull the trigger . . . LUX snow-and-gas smothers the blaze. No pumping to disturb your aim. *Just fire at the fire!* Send the coupon for information on this newest fire-fighter, priced at $10.85.

LUX
SNUFFS OUT FIRE

Walter Kidde & Company
932 West Street, Bloomfield, N. J.

Send me "Instant Death To Fire". I understand it describes the new Kidde-LUX as well as other LUX extinguishers.

Name .....

Company .....

Address .....

against low-price contracts. Both automotive and miscellaneous needs are heavier.

Buffalo—Sheet and strip production is the heaviest in more than a year. Automotive specifications have increased, though principally buying is by miscellaneous consumers.

St. Louis—Business continues to expand, both in specifications and new orders. Miscellaneous demand remains the chief support, with stove, metal furniture, refrigerator and container manufacturers accounting for large tonnages. Galvanized roofing sheets are moving actively to the South and Southwest.

Birmingham, Ala.—Sheets, while hardly up to expectations in the aggregate, continue one of the major steel items. Demand remains fairly evenly divided between manufacturers' and roofing sheets.

Tin Plate

Tin Plate Prices, Page 68

Consumers have been notified that fourth quarter tin plate business will be accepted at the current market of $5 per base box, Pittsburgh. However, this does not preclude the possibility of a price increase later in the year and is not regarded as complete reaffirmation. This leaves the way open for higher prices that may be necessary subsequently to cope with anticipated export business.

Tin plate operations continue to decline, last week being estimated at 60 per cent, off 4 points. Business is declining seasonally although supported somewhat by better demand for general line cans. Mill stocks are fairly low, with canmakers well supplied. Export inquiries are heavier, principally from neutrals, but an upturn in foreign shipments is not expected immediately.

THE MONMOUTH PRODUCTS COMPANY, Cleveland, Ohio, have more than doubled their carburizing capacity, and improved the physical qualities, of tie rod ball studs and king pins with the installation of a Hevi Duty Vertical Retort Carburizer. With their former method of pack carburizing, only two charges of approximately 2,000 parts each could be carburized in a day. In the Hevi Duty Carburizer, three loads of 3,000 parts each are carburized in the normal daily production with no increase in floor space.

Send for Bulletin HD 937 — it describes the Vertical Retort Carburizing Furnace.

HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVI-DUTY ELECTRIC EXCLUSIVELY

MILWAUKEE, WISCONSIN

Plates

Plate Prices, Page 68

Pittsburgh—Producers do not expect an immediate increase in export business, although heavier demand from both neutrals and warring countries is looked for eventually. Clarification of the neutrality act is awaited, although most steel products do not come within the scope of this measure.

Boston—Buying continues to lag. Specifications are light, except from shipyards. Little specified work is active following two contracts taking 1000 tons for a New Britain, Conn., filter plant. Fabricating shops are placing scattered car lots and some improvement is expected in boiler and heating equipment shortly. Railroad releases continue slack.

Philadelphia—Export prices on plates, exceptionally weak in recent months, have increased about $9 a ton to the equivalent of 2.10c f.a.s. Most mills are quoting on an f.o.b. mill basis with freight allowed. Little business has developed so far, partly because of the shortage of ships. Domestic demand is the heaviest in months, as producers sense a strong trend in prices. The maritime commission opened bids Sept. 20 on one C-3-A merchant ship requiring about 4000 tons of hull steel.

Birmingham, Ala.—Plates retain leadership among heavier steel items with considerable tonnage going into shipbuilding and quite considerable business coming from tank manufacturers.

Seattle—Award of 1400 tons of plates for the Mud Mountain dam is immediately pending at Seattle, general contract to Guy F. Atkinson Co., San Francisco. American Radia-

tor & Standard Sanitary Corp., New York, has the award at $185,666 for emergency gate air inlet and drum gate spillway, Coulee dam, involving an unstated tonnage of 12 and 16 inch lap welded steel pipe.

San Francisco—Plate awards were confined to lots of less than 100 tons and so far this year bookings total 35,514 tons, compared with 25,130 tons for the same period a year ago. Large pending projects include 3000 tons for a welded steel or monolithic concrete pipe line for the water and power department, Los Angeles, 629 tons for the bureau of reclamation, delivery at Sacramento, Calif., and 250 tons for a 25-ton revolving crane on a welded steel pontoon for the Mare Island, Calif., navy yard.

Plate Contracts Placed

246 tons, 10-inch welded, for state hospital, Warm Springs, Mont., to Thompson Mfg. Co., Denver.

240 tons, eight oil tanks, Bradford, Pa., to Hammond Iron Works, Warren, Pa.

Plate Contracts Pending

Unstated, 1200 ft. 60 and 72-inch welded steel pipe, alternate wood, Bellingham, Wash., water system; bids Sept. 21.

Bars

Bar Prices, Page 68

Cleveland—Business spurted last week, being influenced by gains in consumption and by anticipation of higher prices that will result to some buyers next month through new quantity extras. In addition, the upturn in general commodity prices is reflected in heavier steel buying. Mills have declined business beyond September at current quotations. Automotive and farm implement interests have been more prominent in recent bookings, although demand is well diversified.

Chicago — Business is being stimulated by increased consumption, by desires to cover early needs before foreign demand expands and by the urgency to place orders prior to application of new extras Oct. 1. Expectations of higher base prices next quarter also are a factor. Domestic demand includes heavy automotive tonnage, increased railroad needs and a slight gain in requirements of miscellaneous buyers.

Boston—Specifications for hot carbon bars have declined. Warehouses, through which a large portion of the tonnage in this territory is distributed, have built up stocks for expected future improvement in consumption. Direct buying by larger industrial users has also slackened. Orders for alloy material, however, continue steady and relatively better than carbon bars, most business being distributed by secondary sellers. Machine tool builders are steady consumers.

New York—Demand generally is heavier, partly the result of expanding needs and improved prospects and in a lesser degree to the desirability of laying in extra tonnage before current contracts expire. There is less of the latter buying than might be expected, since many consumers are uncertain as to specifications on some items in view of recent foreign developments. Best gains in demand are from machine tool and auto accessory manufacturers.

Philadelphia — Heavy specifications have booked bar producers for the remainder of September on practically all items. Tonnage in some grades is more than can be turned out this month.

Birmingham, Ala.—Output of bars is particularly good, most being for concrete reinforcing, although there has been some increase in merchant

COMPACT

Shafer roller bearings, with their self-alignment and radial-thrust capacity, inherent features of the concave roller-convex raceway design, provide generous capacity in compact installations. Shafer gives you "everything you need in a roller bearing"—without unnecessary bulk or weight.

SHAFER BEARING CORPORATION
35 East Wacker Drive, Chicago, Ill.

Available in a full range of sizes: Pillow Blocks • Welded Steel Pillow Blocks • Flange Units • Take-up Units • Hanger Boxes • Cartridge Units • Flange-Cartridge Units • Duplex Units • Conveyor Rolls • Radial-thrust Roller Bearings

Registered U. S. Patent Office

CONCAVEX

SHAFER *Self-Aligning* ROLLER BEARINGS

bars from producers of agricultural implements.

Pipe

Pipe Prices, Page 69

Pittsburgh—Tube mill operations are gaining. Domestic business is heavy, new commitments showing improvement the past few days. Export orders so far are light, but inquiry has been good. Mills are preparing for expected rush of business in the event changes in the neutrality act permit shipments of war materials. Oil country goods are more active with the pickup in drilling operations. Standard pipe is moving well and line pipe releases are fairly heavy. Weakness in merchant prices is disappearing.

Boston — Releases against cast pipe orders continue active, but buying has slackened. Hartford, Conn., placed 390 tons of large diameter cement lined pipe and fittings. Steel pipe, small diameters, moves steadily with housing projects in the Boston district up for estimates taking several hundred tons. Resale prices, while somewhat improved, are still being shaded, although mill quotations are firm.

Cleveland — Business continues active. Merchant pipe demand is sustained, with heavy shipments in prospect well into next quarter. Line pipe production, relatively brisk, is at the expense of backlogs, though additional business in smaller lines is in sight. Prices have strengthened in resale markets.

Chicago — Cast pipe is quiet, and it is feared the European situation will have an adverse effect on construction involving this product. Little tonnage is pending locally, except 203 tons of fittings for Chicago, but 800 tons is expected to be bought by Grand Rapids, Mich.

New York — Steel pipe inquiry is heavy, and a peak in demand is expected late this month or early in October. Prospects are favorable for substantial pipe demand for proposed oil refinery work. Boiler tube business from shipbuilders is expected to be sustained. An additional 500 tons of 12-inch pipe for the local belt highway between Whitestone bridge and the Rockaways has been placed with Youngstown Sheet & Tube Co. Thirty thousand lineal feet of small diameter pipe for grouting purposes and 500 tons of larger pipe and fittings for the Lackawack dam are reported placed with an eastern mill. Resale prices on pipe are stiffening.

Seattle—Inquiry is fair for cast iron pipe although no large projects are up for figures. Sunnyside, Wash. plans a $90,000 improvement involving supply and distributing lines. Central Construction Co., Seattle, has the general contract for the McChord Field distributing system, 550 tons of cast pipe. Seattle has opened bids for the Thirtieth ave. N. E. improvement and Sept. 15 will open bids for 1300 water meters.

San Francisco — While carload business in cast iron pipe continues to hold up well, awards were in lots of less than 100 tons and only four projects of size are pending.

Cast Pipe Placed

390 tons, 42 and 48-inch cement lined with fittings, Hartford, Conn., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.

175 tons, 6-inch, Providence, R. I., to Warren Foundry & Pipe Corp., Everett, Mass.

100 tons, Leavenworth, Wash., reclamation bureau fish hatchery, to Lynchburg Foundry Co., Lynchburg, Va.

Ferroalloys

Ferroalloy Prices, Page 70

New York — Growing belief that ferromanganese prices will be in-

FORGINGS ARE VITAL TO THE MACHINES OF INDUSTRY
AUTOMOTIVE
Forgings ...
LOWER COSTS
. . . for forgings vital to today's speedy motor cars, trucks and buses are assured by the dependable and accurate operation of Erie Steam and Board Drop Hammers . . . a fact proven by the long use of these hammers in the industry . . . 36 years of design and construction progress are yours when you place your forging problems before Erie engineers . . . Bulletins No. 325 and No. 328 on Steam and Board Drop Hammers are yours for the asking.
Turning out lower cost forgings in the plant of one of the leading automobile manufacturers.
ERIE
Time-saving machines made this hammer.
Making this hammer made many jobs for men.
ERIE FOUNDRY CO.
ERIE, PENNSYLVANIA, U. S. A.
DETROIT 538 Curtis Bldg.
CHICAGO 549 Washington Blvd.
INDIANAPOLIS 536 Postal Station Bldg
FRANCE Fenwick, S. A.
CANADA John Bertram & Sons Co., Ltd.
ENGLAND Burton, Griffiths & Co., Ltd.
ERIE BUILDS Dependable HAMMERS

creased when fourth quarter books are opened this week has resulted in a sharp gain in specifications. Undoubtedly September shipments will be the heaviest so far this year. Consumers also are desirous of circumventing a possible shortage later in the year. Trade leaders doubt if higher prices will affect all ferroalloys, manganese items being thought the most likely to change, because of the ore situation.

Wire

Wire Prices, Page 69

Cleveland—Demand is tending upward, supported principally by gains in consumption of manufacturers' wire and by a fairly active call for merchant products. Some business is attributed to expectations of higher prices before the end of the year. While automotive needs have been somewhat slower to expand than was expected, a more rapid increase is in sight the next few weeks.

Chicago—Buyers are showing considerable interest in possible price revisions, meanwhile ordering at a sustained or higher rate. Demand for merchant products is better than expected. Producers are optimistic over fall prospects, with expectations that recent hand-to-mouth buying will be supplanted by more extensive forward coverage. Some price adjustments are thought not unlikely soon.

Boston — Finishing operations in most wire mills have been increased with a material improvement in orders, notably for manufacturers' wire and some specialties. Releases for prompt delivery are heavier with buyers in numerous instances seeking forward coverage at current prices. Consumer inventories are being increased as current needs, with few exceptions, have not mounted to the extent indicated by heavier buying. Export orders are appearing in greater volume.

New York — With the exception of merchant products, wire orders have increased materially, both for prompt delivery and protection at current pices. Some tonnage is being booked which is not likely to be shipped before fourth quarter. Sharp upturn in export orders is anticipated, a development which has already started. Largest gains have been made by manufacturers' wire. More specifications are appearing from the automotive industry. Spring wire demand is holding, with some improvement in rope noted from the general industrial trade.

St. Louis—Specifications for wire and wire products have shown definite improvement the past two weeks. Country distributors report a marked pickup in demand from farmers, resulting in reordering by the former. Warehouses are taking larger lots.

Birmingham, Ala.—Wire products are holding up well, current output being estimated at 80 per cent or better.

Sponge Iron Imported

Philadelphia—Arrival of 138 tons of sponge iron from Sweden is outstanding among iron and steel imports here during the week ending Sept. 2. Other arrivals include 40 tons of structural shapes, 32 tons of steel tubes and 23 tons of steel bars, also from Sweden, and five tons of pig iron from Brazil.

Rails, Cars

Track Material Prices, Page 69

Considerable steel for railroad use is pending, especially for rolling stock. Cars on which bids have

NEWPORT PRODUCTS

Hot Rolled Sheets • Cold Rolled Sheets • Newport Electrical Sheets • GOHI Pure Iron-Copper Alloy Sheets • Globe Brand Galvanized Steel Sheets, Roofing and Siding • GOHI Enameling Iron Sheets • KCB Copper Steel Sheets • Newport Long Terne Sheets • Newport Galvannealed and DeLuxe Metal Sheets.

LEADING enamelers quickly recognize the outstanding superiorities of GOHI Enameling Iron and the many production advantages made possible through its use, with the result that this fine metal is accorded top rating by those who demand the utmost in performance, whose manufacturing facilities are geared up to highest operating efficiency.

GOHI Enameling Iron is metallurgically pure, free from grease and pickle marks. The smooth, satiny surface holds the enamel tightly — many common enameling troubles are eliminated, and the appearance and longevity of the finished product are immeasurably improved.

THE NEWPORT ROLLING MILL CO.
NEWPORT KENTUCKY
DIVISION OF THE ANDREWS STEEL CO.

ANDREWS PRODUCTS IN CARBON AND ALLOY STEEL: Blooms • Forging Billets • Re-rolling Billets • Slabs • Universal Mill Plates • Sheet Bars

Behind the Scenes with STEEL

Show Goes On

■ To the thousands who have been anticipating attending the Machine Tool Show in Cleveland, the announcement of its indefinite postponement (See page 17) will be, as it is to STEEL, a decided disappointment. To ease this disappointment, however, and to give you the fullest possible information on latest developments, STEEL, in the role of the trouper, says the "show must go on." The orders here are for a bigger and better Machine Tool Issue which will bring you on the morning of September 25 a complete machine tool and accessory show on paper. When you stop to think about it, this show by STEEL will not only save you a lot of time and traveling expenses, it will go a long way toward conserving your health and shoe leather. On the basis of our $4.00 a year subscription price, this machine tool show by STEEL will set you back exactly seven and a half cents. What a buy! Our slogan department, working on a 24-hour shift, has already flashed us this gem:

There's No Reason to Worry, No Reason to Fret. You'll Be H e a l t h i e r, Wealthier, and Wiser Yet!

So, cancel that reservation on the sleeper to Cleveland, forget about packing your bag, turn back your expense advance and look forward to a really knock-out show and exhibition that you can take home to your easy chair the night of September 25 and enjoy with your slippers on.

Worth Remembering

■ Twenty-five years ago this week in STEEL, Judge Gary, on his return from several months in Paris assisting in the evacuation of Americans, made the following statement: "It is to be expected there will be gross misrepresentations concerning the conduct of contending armies. Sometimes statements are made that are fictitious and representations, with some basis of truth, are enlarged beyond the actual facts. We should, I think, wait for thorough inquiry and positive proof before reaching conclusions." Good advice then as now.

Enterprising

■ All of this talk about Canadian industry coming of age, and the expected boom there, reminds us of the enterprising bait stand we passed along the road in northern Ontario a few weeks ago: *We May Doze,* it read, *But We Never Close.*

Knock-Out

■ Machine Tool show or no Machine Tool show, that is a swell looking spread by Jones & Lamson on pages 48-49 this week.

La Femme Timken

■ And speaking of advertisements, look for the new Timken Roller Bearing slogan appearing currently in some general magazines and in next week's STEEL —*Miles of Smiles.* They have enlisted feminine charm as an advertising ally, they say, and will carry illustrations of beautiful young models with radiant smiles to give that top-notch slogan some extra *umph.* Okay, we can take it.

Strikes Home

■ We thought we had heard every absent-minded professor story in existence but the one about the prof. who sent his wife to the bank and kissed his money good-bye was not only new; it was very unfunny.

Act on Facts

■ A tip: The near and distant future of business activity in this country is beyond the prediction of any source, no matter how well informed. Markets and prices may or may not be soon jumping all over the lot. Now, as never before, the authoritative facts and reliable reports of this magazine STEEL will pay you decided dividends.

SHRDLU

been asked include 800 for the Chicago & North Western, 1000 for Chicago Rapid Transit Co., 500 to 1000 hoppers for Delaware & Hudson and numerous small lots. The Erie has issued an inquiry for 1000 freight cars.

New York board of transportation has awarded 150 subway cars on the low joint bid of American Car & Foundry Co., New York, and Pressed Steel Car Co., Pittsburgh, the former to build 50 and the latter 100 cars.

Car repair work is being undertaken at increased rate, the Pennsylvania adding 400 men at Altoona and 300 at Pitcairn shops to expedite rehabilitation of coal cars.

Chicago, Milwaukee, St. Paul & Pacific is inquiring for material for 1000 to 2000 cars and the Chicago, Burlington & Quincy for 1000 cars, to be built in own shops.

Bureau of reclamation has awarded to Colorado Fuel & Iron Corp., Denver, 2081 gross tons of 131-pound and 489 tons of 112-pound rails, 1638 kegs of spikes, 293 kegs of bolts, 191 tons of angle bars and 865 tons tie plates, for use in relocation of Southern Pacific tracks in connection with Shasta dam in the Central Valley, California, project.

Domestic freight car orders in August totaled 2814 cars, second only to the April total of 3095. Outstanding was the Chesapeake & Ohio order for 2500 cars. Total for the first eight months is 12,456 cars, against 8203 in the corresponding period last year, 48,490 in the first eight months of 1937 and 35,563 in the same period in 1936. Further comparisons follow:

	1939	1938	1937	1936
Jan.	3	25	17,806	2,050
Feb.	2,259	109	4,972	6,900
March	800	680	8,155	632
April	3,095	15	9,772	4,427
May	2,051	6,014	4,732	8,900
June	1,324	1,178	548	5,200
July	110	0	1,030	7,229
Aug.	2,814	182	1,475	225
8 mos.	12,456	8,203	48,490	35,563
Sept.	.....	.....	1,750	1,216
Oct.	.....	.....	2,537	1,355
Nov.	.....	.....	1,232	275
Dec.	.....	.....	2,581	275
Total	.....	.....	16,303	51,611
				64,523

Rail Orders Placed

Bureau of reclamation, 2570 tons 112 and 131-pound rails, plus fastenings, to Colorado Fuel & Iron Corp., Denver; for Southern Pacific Central valley relocation.

Car Orders Placed

New York board of transportation, 150 subway cars, 50 to American Car & Foundry Co., New York, 100 to Pressed Steel Car Co., Pittsburgh.

Car Orders Pending

Chicago, Milwaukee, St. Paul & Pacific,

1000 to 2000 cars, bids asked on material for construction in own shops.

Chicago, Burlington & Quincy, 1000 cars, bids asked on material for construction in own shops.

Erie, 500 fifty-ton box, 250 seventy-ton gondolas, 200 fifty-ton hoppers, 50 seventy-ton flat cars.

Shapes

Structural Shape Prices, Page 68

Pittsburgh — Shape orders continue fairly heavy. Awards and inquiries are principally for public works, following several weeks in which private business was prominent. Most orders are small, one of the largest being 780 tons for a grade separation, Louisville, Ky.

Chicago—Structural inquiries are more numerous and generally involve larger tonnages, although the usual volume of small projects continues. New work includes 775 tons for a Wisconsin highway bridge.

Boston — Structural steel tonnage to fabricating shops is light, following award of 5000 tons for a Boston office building. Awards include a 220-ton bridge, New Hampshire, a steel arch span, and other smaller bridges. Inquiry is light. Plain material prices are firmer with little buying.

New York — Structural contracts have declined, award of 950 tons for the Lackawack dam, Delaware aqueduct, New York, being outstanding. Inquiry is also off, notably for public works projects. Plain material prices are firmer, but buying is light. Some improvement is also noted in fabricated and erected quotations.

Philadelphia—Scrap is scarce and counter increasing interest with builders rushing plans to get quotations before a possible advance. At the moment orders and active inquiries are light.

Buffalo — Activity is centered on a number of small projects, major jobs now having been closed. Orders for several lots of 200 to 250 tons are included among recent awards.

Seattle—Interest centers in the navy award for construction of air bases at Kodiak and Sitka, Alaska, contract to Siems-Spokane Co., Spokane, Wash., Johnson, Drake & Pieper Inc., Minneapolis, and Puget Sound Bridge & Dredging Co., Seattle, joint low bidder at $12,739,000. Tonnages have not been released.

San Francisco—A fair volume of structural lettings were reported, aggregating 3760 tons, bringing the total for the year to 90,510 tons, compared with 94,923 tons for the corresponding period in 1938. The outstanding award went to Bethlehem Steel Co., 1386 tons of piles for improvement of the Los Angeles river channel, Los Angeles.

Birmingham, Ala. — One of the most reassuring factors is the sustained demand for shapes, much for public construction, especially roads, and considerable private building.

Shape Awards Compared

	Tons
Week ended Sept. 9	**13,816**
Week ended Sept. 2	**23,897**
Week ended Aug. 26	**25,273**
This week, 1938	**18,088**
Weekly average, year, 1938	**21,568**
Weekly average, 1939	**21,938**
Weekly average, August....	**18,739**
Total to date, 1938	**652,003**
Total to date, 1939	**789,761**

Includes awards of 100 tons or more.

AMERICAN
SUPER-HEAVY-DUTY
ROLLER BEARINGS

In every industry, including your own, there are some super-operations that involve unusually severe loads and strains. The machinery used must be "super" too — including the bearings that carry the load. American Super-Heavy-Duty Roller Bearings are *right* for such installations. They're not only Super *Heavy-Duty* Bearings — they're *super bearings* in every other way, too. American Roller Bearing Company, Pittsburgh, Pa. *Pacific Coast Office:* 321 West Pico St., Los Angeles.

AMERICAN
Heavy-Duty ROLLER BEARINGS

No especially large individual tonnage is in evidence.

Shape Contracts Placed

1386 tons, piles and bearing piles, improvement of Los Angeles River channel, Los Angeles to Bethlehem Steel Co., Los Angeles, through general contractors, Griffith & Co., Los Angeles.

950 tons, Lackawack dam, Delaware Aqueduct, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Mason & Hanger, New York, general contractor; bids July 25.

920 tons, highway project MS-39-15, Queens, N. Y., to American Bridge Co., Pittsburgh, through P. Tomasetti Contracting Co., New York, general contractor.

780 tons, grade separation, Seventh and Magnolia streets, Louisville, Ky., for state, to American Bridge Co., Pittsburgh.

755 tons, highway bridge, Elkton, Md., to Bethlehem Steel Co., Bethlehem, Pa.

675 tons, bridge, Cross county, Arkansas, to Vincennes Bridge Co., Vincennes, Ind.

600 tons, warehouse at Seattle, for Columbia Steel Co., to Columbia Steel Co., San Francisco.

600 tons, suspension conveyor and walk bridges, T.V.A., Spring City, Tenn., to Sherman & Reilly Co. Inc.

500 tons, bridge, Pittsburgh county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

470 tons, transmission towers, T.V.A., Memphis, Tenn., to Bethlehem Steel Co., Bethlehem, Pa.

455 tons, beam bridge, Harvard, Ill., to American Bridge Co., Chicago.

415 tons, post office addition, Dayton, O., to Burger Iron Co., Akron, O.

375 tons, state bridge FAP-242-B, Sturgis, S. Dak., to Bethlehem Steel Co., Bethlehem, Pa.

375 tons, 14 cranes for Mare Island, Calif., navy yard, specification 9236, to Harnischfeger Corp., Milwaukee.

360 tons, bridge 5872, Stephen, Minn., and Grafton, N. Dak., for state of Minnesota, to Minneapolis-Moline Power Implement Co., Minneapolis.

350 tons, state bridge 4.15, Marble Cliff, O., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, post office and courthouse, Mobile, Ala., to Ingalls Iron Works Co., Birmingham, Ala.

300 tons, Leech Farm sanitarium, Pittsburgh, to Pittsburgh Bridge & Iron Co., Pittsburgh.

260 tons, channel improvement, United States government, Hornell, N. Y., to American Bridge Co., Pittsburgh.

255 tons, bridge No. 1844, Gibson-Pike county, Indiana, to American Bridge Co., Pittsburgh.

250 tons, addition to plant of Curtiss aeroplane division of Curtiss-Wright Corp., Buffalo, to R. C. Mahon & Co., Detroit; Darien & Armstrong, general contractors.

250 tons, state highway bridge RC-4060, Monroe county, New York, to American Bridge Co., Pittsburgh; Jodomar Inc., Rochester, contractor.

225 tons, State street subway, contract S7, Chicago, to American Bridge Co., Pittsburgh.

220 tons, 175-foot steel arch bridge, Pemigewasset river, Woodstock, N. H., to Lackawanna Steel Construction Corp., Buffalo.

190 tons, theater and store building, Taft estate, Cincinnati, to Jones & Laughlin Steel Corp., Pittsburgh.

175 tons, reconstruction of bridge 31.57, Pennsylvania railroad, East Dowington, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, state highway bridge, project FAS-SS-39-13, Dutchess county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; John Arborio Inc., Poughkeepsie, N. Y., contractor.

150 tons, state bridge 1, RC-4050, Bowmansville, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, state bridge FAP-77-A, Yankton, S. Dak., to Bethlehem Steel Co., Bethlehem, Pa.

145 tons, cell block, Green Haven prison, New York, to Belmont Iron Works, Philadelphia, through Arthur Gallow Co., New York, general contractor.

140 tons, factory and garage, Milco Undergarment Co., Bloomsburg, Pa., to Weatherly Steel Co., Weatherly, Pa.

135 tons, bridge, Miller county, Arkansas, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

135 tons, warehouse and garage, T. W. Phillips Gas & Oil Co., Butler, Pa., to Pittsburgh Bridge & Iron Works, Rochester, Pa.

110 tons, Decorah bridge, FAS-291A, Winneshiek county, Iowa, to Clinton Bridge Works, Clinton, Ia.

110 tons, bureau of roads warehouse and shops, Juneau, Alaska, to Isaacson Iron Works, Seattle.

100 tons, plate girder bridge, Coconino county, Arizona, to unnamed interest.

100 tons, garage and warehouse, specification 1234-D, Leavenworth, Wash., to unnamed interest.

Shape Contracts Pending

2500 tons, two seaplane hangars, Alameda, Calif.

1100 tons, paper mill at Plymouth, N. C., for Kiechefer Container Co., Delair, N. J.; specifications out soon.

900 tons, state bridges 601 and 602, Eau Claire, Wis.

800 tons, apartment house, for Louis Cowan, New York.

778 tons, Bridge of the Gods, Columbia River; Tavares Construction Co., Los Angeles, general contractor.

700 tons, storehouses and power plant, bureau of yards and docks, Alameda, Calif.

650 tons plus, 504 steel towers, extensions, etc., Bonneville power lines; bids to Bonneville Authority, Portland, Oreg., Sept. 23.

500 tons, bridge 458-A and miscellaneous bridge repairs, Atchison, Topeka & Santa Fe railway, Canadian, Tex.

500 tons, Edgar Allen Poe housing project, Baltimore.

450 tons, bridge, Allegheny county, New York, E. W. Foley Inc.; New York, general contractor.

350 tons, gate frames, specification 876, bureau of reclamation, Coram, Calif.

275 tons, yard structures, Commonwealth Edison Co., Chicago.

240 tons, heating plant, United States government, Lowry field, Denver.

225 tons, snag boat hull, federal engineers' office, Memphis, Tenn.

220 tons, library, Hyde Park, N. Y.; John McShain, Philadelphia, awarded general contract.

AGILE A. C. RODS

are worth checking, because their special coating and wide range of analyses keep them right up in front with the advance of A. C. welding. Built especially for the popular A. C. type welding machines, AGILE electrodes are as modern as tomorrow.

★

AMERICAN AGILE CORPORATION

5806 HOUGH AVENUE

CLEVELAND, OHIO

175 tons, service building, department of agriculture, New Orleans.

140 tons, Woolworth store at Wilmington, Del.

120 tons, state bridge 620, McCartney, Wis.

115 tons, Chicago, Milwaukee & St. Paul railroad bridge repairs, Chicago.

115 tons, bridge, Chartiers avenue, Pittsburgh.

105 tons, highway bridge, McCartney, Wis.

100 tons, Kremlin bridge, Mont.; bids to Denver, Sept. 14.

Reinforcing

Reinforcing Bar Prices, Page 69

Pittsburgh — Demand is steady, with inquiries coming out in fair volume. Interest is centered on prices, which apparently are firm in spite of pressure from some quarters. Approach of less favorable weather has induced the speeding up of some projects.

Chicago — Orders are sustained, headed by 2700 tons for sewage treatment plants at Fort Wayne and Hammond, Ind. Pending work includes 1400 tons for an addition to the Montgomery Ward & Co. building here. Some intimations are heard of possible price increases in the near future.

New York — Concrete reinforcing bar prices are steadier, a greater number of sales being made at full list prices. Inquiry is slow, mostly small lots, but awards are up, 3000 tons, square twisted bars, for the Lackawack dam being outstanding.

Seattle—The market has firmed and shows a steadier tendency after a period of instability. Mills have fair backlogs but no important projects are up for figures. Business pending is of small proportions.

San Francisco — The reinforcing bar market was active and 4549 tons were booked, bringing the year's aggregate to 116,499 tons, compared with 94,397 tons for the same period last year. The Utah Concrete Pipe Co., Salt Lake City, Utah, secured the contract for 10-miles of a 40-mile reinforced concrete pipe line for the Provo river project in Utah, involving 4000 tons of bars.

Concrete Bars Compared

	Tons
Week ended Sept. 9	**13,750**
Week ended Sept. 2	**13,046**
Week ended Aug. 26	**6,203**
This week, 1938	**17,114**
Weekly average, year, 1938	**6,959**
Weekly average, 1939	**9,893**
Weekly average, August	**7,894**
Total to date, 1938	**260,063**
Total to date, 1939	**356,145**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

4000 tons, 10-miles of a 40-mile reinforced concrete pipe line for Provo River project, Utah, to Utah Concrete Pipe Co., Salt Lake City, Utah, at $522,353.

3000 tons, square twisted bars, Lackawack dam, contract 340, Delaware aqueduct, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Mason & Hanger, New York, contractor, bids July 25.

1500 tons, Mud Mountain flood control project, Washington state, to Northwest Steel Rolling Mills, Seattle; Guy F. Atkinson Co., San Francisco, general contractor.

1500 tons, sewage treatment plant, Fort Wayne, Ind., to Truscon Steel Co., Youngstown, O.; Weymouth Construction Co., contractors.

1000 tons, reservoir, Grand Rapids, Mich., to Calumet Steel Co., Chicago.

600 tons, section, Pennsylvania turnpike, to Concrete Steel Co., New York; Johnson, Drake & Piper Co., New York, contractor.

500 tons, sewage treatment plant, Rock Island, Ill., to Laclede Steel Co., St. Louis; Stark Construction Co., con-

INLAND
4-WAY
Floor Plate
Safe floors save time in addition to preventing accidents. Inland's 4-Way safety tread provides dependable traction in all directions, for feet and wheels. No plant can be efficient with bad floors. Make yours right for years to come with Inland 4-Way Floor Plate.
Order from your Jobber or write for 16-page Floor Plate Booklet
INLAND STEEL CO.
38 SOUTH DEARBORN STREET, CHICAGO
Sheets • Strip • Tin Plate • Bars • Plates • Structurals • Piling • Rails • Reinforcing Bars

tractor.

425 tons, sewage plant, Rutherford, N. J., to Fireproof Products Co., New York; F. H. McGraw Co., Hartford, Conn., general contractor.

350 tons, sewer, Brooklyn, N. Y., to Igoe Bros., Newark, N. J.; Delhan Construction Co., contractor.

250 tons, barracks at Pearl Harbor, T. H., specification 9156, to Columbia Steel Co., San Francisco.

250 tons, water works, Indianapolis, to Truscon Steel Co., Youngstown, O.

150 tons, Washington state highway work, to Northwest Steel Rolling Mills, Seattle.

125 tons, route R-168, Monroe county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.; Primo Marinelli, contractor.

100 tons, miscellaneous construction projects in Seattle and Alaska to Northwest Steel Rolling Mills, Seattle.

Reinforcing Steel Pending

1200 tons, sewage treatment plant, Hammond, Ind.

1100 tons, Anacostia sewage plant, contract 9, Bladensburg, Va.; Virginia Engineering Co., Newport News, Va., low.

700 tons, building, Marathon Paper Co., Menasha, Wis.

275 tons, route 110, section 6B, Rapid Transit railroad, New York; Johnson Corp. and Necaro Co., low bidder.

250 tons, cell blocks for prison at Walla Walla, Wash.; bids opened.

200 tons, bridge 8146 over White river, Knox county, Illinois.

158 tons, bureau of reclamation, invitation 37,624-A, Deer Creek, Utah; bids opened.

Pig Iron

Pig Iron Prices, Page 70

Cleveland—Shipments are heavier and new business is more active, although sellers have not been soliciting forward contracts. Some business for fourth quarter shipment has been entered, subject to prices applying at that time. Possibility of higher prices is quickening movement against old contracts, particularly since consumer inventories lately have been moderate.

Chicago — Pig iron sellers are flooded with orders and inquiries. Large lots are included among such business, many consumers attempting to cover fourth quarter needs. In the absence of price establishment for next period sellers are not active in soliciting business. Tonnage for delivery the remainder of September is being booked at $21, with shipments against old $20 contracts scheduled to end Oct. 1. A higher market is indicated next quarter. Foreign inquiries are being received, but prices offered are $3 to $4 below the domestic market.

New York—Domestic orders lately have been the heaviest in months, with the increase in number of purchases being particularly marked. Export inquiry also is more active, especialy from Scandinavian countries. Scarcity of ships presents a problem in export business at the moment. No important inquiries are reported from England or France. Buyers look for higher pig iron prices before the end of the year, if not for the entire fourth quarter.

Philadelphia — Eastern pig iron sellers, while not having formally opened their books, are taking heavy orders for fourth quarter at unchanged prices. Many trade interests look for an advance later, but by the time consumers generally are expected to be well covered for the remainder of the year. Substantial export business is tentatively pending, including round tonnage for the Orient, it is said. However, scarcity of bottoms is an important delaying factor at the moment.

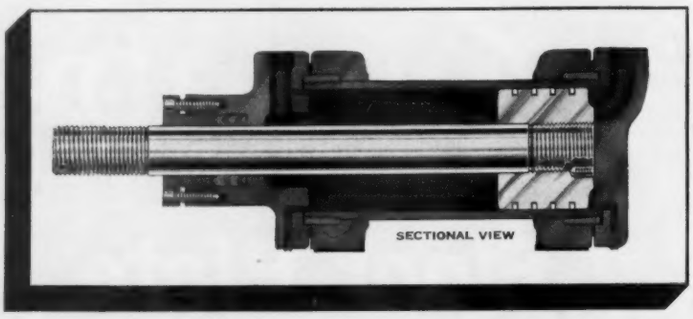
Buffalo — Shipments are increasing, with new business near the best level of the year. Foundry operations are improving although apparently less rapidly than deliveries. Inquiries are heavier. Nine of 14 blast furnaces continue active.

Cincinnati — The market is more active despite absence of fourth quarter price announcements. Improvement in the melt and consumers' desire to take in iron against low-price contracts entered a year ago are stimulating shipments. No. 1 furnace of Hamilton Coke & Iron division of American Rolling Mill Co. is in blast after relining.

St. Louis—Consumers are anxious to take iron still due against contracts, and new orders also have increased lately. Such demand is not largely speculative, resulting principally from actual requirements and for replenishment of low inventories. Operations of stove, heating equipment and farm implement plants are higher. August pig iron and coke shipments were the best so far this year, with a further gain indicated for September.

Birmingham, Ala.—Pig iron production is steady with indications of substantial pick-up. Fourteen furnaces are blowing and Sloss-Sheffield will add one of its North Birmingham stacks on manganese in the near future.

Toronto, Ont.—Melters show more concern over future prices and supplies. A number of users have covered through the remainder of the



PRACTICAL HYDRAULIC CYLINDER ADVANTAGES . . . Hannifin high pressure hydraulic cylinders are stronger, simpler, easier to use. Their exclusive design assures high efficiency operation and extra ruggedness to withstand severe service. Check these features: *No tie rods.* End caps are removable without collapse of other parts. *Universal caps.* Can be positioned with inlet port at top, bottom, or either side. Can be moved without disturbing mounting. *Air Vent plugs.* Each cap has air vents on three sides. *Leakproof.* Special mirror finish honing produces a cylinder bore straight, round, perfectly smooth. No leakage and minimum fluid slip.

Write for new Bulletin 35-S with complete specifications.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue, Chicago, Illinois
Engineers • Designers • Manufacturers
Pneumatic and Hydraulic Production Tool Equipment

HANNIFIN hydraulic CYLINDERS

ONE STEP FROM YOUR TRAIN

TWO STEPS FROM ANYWHERE

IS COMFORTABLE

HOTEL CLEVELAND

with . . .

A friendly welcome.

Food that is famous.

Instant, willing service.

Rooms with every detail planned for restful comfort.

Convenience that saves time and taxi fare. Hotel Cleveland adjoins the Union Terminal and Terminal group, and is at the very heart of Cleveland, Ohio.

HOTEL CLEVELAND Cleveland

year, in contrast to previous spot buying. Such business is being placed at current prices, though conditions are favorable for a stronger market.

Scrap

Scrap Prices, Page 72

Pittsburgh—The market is strong, but prices are more or less nominal as scrap holders look for higher quotations to follow increased steelmaking and the outbreak of war. No. 1 steel is 50 cents higher at $16.50 to $17 on broker transactions at that level. There are unverified reports of mill buying at a still higher figure.

Cleveland — Scrap is marking time with quotations held firmly. Sales are few and mostly for miscellaneous grades. Melters show little interest.

Chicago — Prices have become highly nominal. No. 1 steel was bought by a mill at $14 slightly more than a week ago, but dealers are retaining a large part of their accumulations and brokers find it necessary to bid above the current market in covering. In some grades as much as $1 above recent list prices has been paid.

New York — Lack of cargo space, cancellation of charters and the generally confused situation arising from the European war has slowed buying of scrap for export. Material has piled up here and at other eastern ports and unless boats become available soon buying will be further curtailed. Shippers expect the situation will be clarified in the next two or three weeks. Prices for barge delivery are unchanged. Domestic shipments are slowly rising with steelworks and foundries buying slightly better. Cast grades are up 50 cents and heavy melting steel for rail shipment is also stronger.

Philadelphia—Scrap is scorce and generally higher. On some grades dealers are reluctant to quote, due to uncertainty as to what they would have to pay in covering contracts. Recent strength has caused some losses in covering. These advances are causing higher quotations in absence of consumer buying. One ship is scheduled for loading here shortly but bottoms are few and this may cause easing in price later on, if continued. Although domestic consumption appears likely to expand some consumers are moving cautiously on the theory prices are advancing too fast and that there will be at least a temporary reaction. Reflecting strength is sale of

400 tons of No. 1 steel at $16.33 by the local navy yard and Edward G. Budd bundled sheets at more than $16.

Buffalo — Prices have advanced sharply, with No. 1 steel up $1 and No. 2 steel 50 cents higher. In view of the foreign situation the future of export business is regarded as uncertain. Possibility is seen that difficulties in shipping scrap abroad may increase supplies available to this market from nearby districts

Detroit — Reflecting upturns in other districts, the scrap market is stronger as far as sentiment is concerned, but on the basis of mill buying no increase in prices appears justified. Steelmaking in this district is virtually at 100 per cent capacity and likely to continue at that level for some weeks, presaging increasing demand for scrap.

Cincinnati—Prices are unchanged as dealers and brokers attempt to determine effects of the war on the market. Some scrap is being withheld in anticipation of higher prices, and quotations generally are firmer. Activity is confined largely to coverage of orders.

St. Louis — The market is disturbed by European developments which have resulted in divergent opinions in the trade as to future price trend. Some country dealers are holding their stocks in anticipation of higher prices, but certain leading brokers and dealers do not look for a broad price advance. Mills currently are out of the market, but recent sales of 16,000 tons of heavy melting steel and cast scrap have created a rather large short interest.

Seattle—The market has developed no particular trend. Japan is buying steadily in small tonnages, regulated by release of credits. Due to low stocks at tidewater, prices are firm at $13.50 and $14 for export grades, mills paying $1 to $2 less.

Toronto, Ont. — Outbreak of war has been without effect on the market, with prices unchanged. Mill demand is active, but dealers now have commitments for only a month or six weeks ahead. Government regulations against profiteering indicate subsequent price changes will be moderate.

Warehouse

Warehouse Prices, Page 71

Cleveland — Early September brought little change in sales, but current and prospective gains in operations of some consumers are expected to be reflected in warehouse business the remainder of the month.

Chicago—Orders last week were curtailed somewhat by the holiday, but warehouses expect a sizable increase in total September business.

New York — Usual seasonal improvement in warehouse volume has appeared although gains have been slight. Prices are firmer. Alloys in small lots are in relatively the best demand.

Philadelphia — Warehouses in August had the best month since late 1937 and anticipate further improvement this month. Prices are unchanged.

Buffalo—Recent moderation in demand is believed only temporary. Orders still are highly diversified.

Cincinnati—The August upturn in business is expected to carry through September. Industrial demand is steady and inquiries point to further gains in demand for building materials.

St. Louis—August sales exceeded July's by a good margin, with demand more scattered. Fencing, roofing and other items for rural areas are moving better.

Seattle — August volume was about equal to that of July, although conditions continued unsatisfactory due to price instability. Light plates and sheets are in best demand, other items moving in small lots.

Activities of Steel Users, Makers

■ LEA MFG. CO., Waterbury, Conn., has arranged with United Chromium Inc., New York, to use the latter's "Unichrome" Rack Coating-W to insulate plating racks. This material is a new and improved rack coating which is said to have outstanding properties of elasticity and tensile strength combined with high resistance to plating and cleaning solutions.

♦

Holland-Rieger division of Apex Electric Mfg. Co., Cleveland, has let contract to the Ferro Enamel Corp., Cleveland, to double production-capacity of its Sandusky, O., plant. Equipment being installed includes a Ferro box-type porcelain enameling furnace, Surface Combustion Corp. low-pressure gas burners, Robbins & Myers electric door hoists, Minneapolis Honeywell control valves, Brown pyrometers and a North American turbo-blower. Pickling and drying facilities are also being expanded.

♦

Ransome Concrete Machinery Co., Dunellen, N. J., has appointed W. S. Hiler & Co., El Paso, Tex., its representative in western Texas, New Mexico, Arizona and certain states in Mexico, for its welding tables and positioners.

♦

Union Metal Mfg. Co., Canton, O., has appointed Charles R. Watts & Co., Seattle, its representative in Washington for Monotube steel piling.

DO YOU USE PARTS LIKE THESE
SPRINGS
STAMPINGS
WIRE FORMS
WASHERS
COTTERS
EXPANSION PLUGS
Hubbard makes them in any material, any quantity.
Modern plant. Complete tool room. Heat treating facilities. Spot welded or tapped assemblies.
Large stocks of smooth, flat, cut washers, also spring washers, cotters, and expansion plugs.
It will pay you to inquire.
M·D·HUBBARD SPRING CO.
645 Central Ave., Pontiac, Mich.

Steel in Europe

Foreign Steel Prices, Page 71

London — (*By Cable*) — Iron and steel industry of Great Britain is completely under control of the minister of supplies and government orders have priority. Other purchasers require licenses, also for export. Prices are fixed and the prevailing schedule is unchanged.

Nonferrous Metals

New York—An avalanches of buying orders swept over nonferrous metal markets last week, disrupting normal trading and lifting all prices sharply. Demand was stimulated by outbreak of war in Europe and realization that it likely would result in higher industrial activity in this country. Toward the end of the week, producers assured consumers that supplies were adequate and that the price rise had been checked.

Copper — Electrolytic advanced rapidly from 10.75c to 12.00c, Connecticut, while resale metal sold up to 13.75c and closed at 12.50c to 12.75c. Producers were still allocating limited tonnages to regular customers at the close. Copper and brass wire and rolled product; brass ingot and other allied prices were advanced proportionately. Sales for the week were estimated at over 40,000 tons.

Lead — After advancing rapidly from 4.90c to 5.35c, East St. Louis, and from 5.05c to 5.50c, New York, the market regained some semblance of stability at the higher levels. This was due in large measure to the statement, issued by Clinton H. Crane, president of St. Joseph Lead Co., that "there is no danger at present to domestic consumers of lead of any shortage of that metal or any further increase in the price for lead in the near future." Although sales tapered from the tremendous volume booked early in the week, buying was still active up to the close.

Zinc—The advance in prime western prices from 4.75c, East St. Louis, to 6.00c came with extreme rapidity for the reason most sellers were unwilling to take business at any price. Many producers have disposed of their entire fourth quarter output.

Tin—Chaotic conditions prevailed in domestic tin throughout the week and practically no quotable market existed. Supplies of Straits spot were scarce although some business was booked with prices ranging up to 65.00c and even 70.00c per pound. At the weekend, the spot market was estimated at around the lower level of that range.

Antimony—Buying interest in this

Nonferrous Metal Prices

	Copper			Straits Tin, New York						Anti-	
Sept.	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi- num 99%	mony Amer. Spot, N.Y.	Nickel Cath- odes
2	11.00	11.00	10.62½	*	*	*	*	5.00	20.00	12.00	35.00
4	Holiday										
5	12.50	12.50	*	*	*	5.25	5.10	5.50	20.00	12.00	35.00
6	12.00	12.00	*	60.50	*	5.25	5.10	6.00	20.00	12.00	35.00
7	12.00	12.00	*	*	*	5.50	5.35	6.00	20.00	12.25	35.00
8	12.00	12.00	*	*	*	5.50	5.35	6.00	20.00	12.25	35.00

* Nominal.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	18.31
Copper, hot rolled	20.12
Lead, cut to jobbers	8.30
Zinc, 100 lb. base	9.75

Tubes

High yellow brass	21.06
Seamless copper	20.62

Rods

High yellow brass	13.63
Copper, hot rolled	16.62

Anodes

Copper, untrimmed	17.37

Wire

Yellow brass (high)	18.56

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	7.00
Cleveland	8.00-8.50
Chicago	8.12½-8.37½
St. Louis	8.00

Heavy Copper and Wire

New York, No. 1	8.87½
Cleveland, No. 1	9.25-9.50
Chicago, No. 1	9.75-10.00
St. Louis	9.00

Composition Brass Turnings

New York	6.25

Light Copper

New York	7.50
Cleveland	7.00-7.50
Chicago	8.12½-8.37½
St. Louis	7.50

Light Brass

Cleveland	4.50-5.00
Chicago	5.87½-6.12½
St. Louis	5.25

Lead

New York	4.65
Cleveland	4.50
Chicago	4.15-4.25
St. Louis	4.25

Zinc

New York	3.25
Cleveland	3.25
St. Louis	3.00

Aluminum

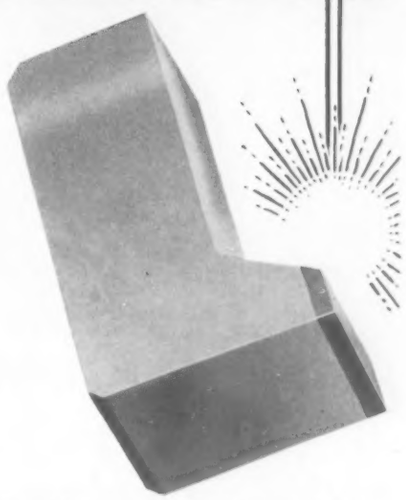
Mixed, cast, Cleveland	8.00
Borings, Cleveland	6.50
Clips, soft, Cleveland	15.00
Misc. cast, St. Louis	7.50

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.75
Standard No. 12 aluminum	12.75-13.00

Eureka

WELDS A CUTTING EDGE



Past the experimental stage for over a year, the successful welding of tool steel is an accomplished fact today with Eureka tool steel electrodes.

If you are not already familiar with the successful, money saving, time and trouble saving application of Eureka alloy electrodes let us hear from you today.

Eureka For *All* Tool Steels

Welding and reconditioning dies for blanking, embossing, coining, cold forging, cold trim, and thread rolling is regular practice with Eureka rods. The cutting edge on flame hardening die steels can be welded, annealed, machined and flame hardened without quenching to approximately 600 brinnell. Shear blades and the atomic welding of forming dies is simple with Eureka alloy rods. And, you can surface carbon steel tools such as cable bits, track tools, stone shaping tools, moulds for plastics with these special Eureka rods.

Start Saving Now!

Start saving at once by using Eureka rods. We'll go over submitted problems carefully.

A *EUREKA* Welding Wire for every purpose.

WELDING EQUIPMENT & SUPPLY CO.

2720 East Grand Blvd.
DETROIT, MICH.

market was aroused and American spot advanced ¼-cent to 12.25c, New York, in cases.

Equipment

Chicago—Counter to expectations machinery and machine tool business is still rather quiet here following Labor day. August sales were close to July but in spite of an indifferent start this month's bookings are expected to exceed those of August substantially. At present however, demand is spotty, and inquiries are claimed to have slowed up, although individual inquiries usually involve larger lots than has been noted previously.

Boston—Harnischfeger Corp., Milwaukee, has been awarded the contract for electric traveling bridge cranes for installation at the Boston, Portsmouth, N. H., Philadelphia, Mare Island and Washington navy yards at $300,690, bids Aug. 23, spec. 9236.

Cleveland—Alliance Machine Co., Alliance, O., has been awarded contract for a 120-ton grantry crane and lifting beam by the Tennessee Valley Authority at $76,889 and $6900 respectively. Equipment is for the Hiwassee dam spillway.

Seattle—The market shows little activity, pumping machinery and electrical equipment leading. Denver is considering bids for furnishing 40 tons of annealed copper wire for the Coulee project. Sterling Pump Co., Stockton, Cal. will supply two turbine pumps for the McChord Field improvement. Bids are in to Bonneville Authority for 24,000 feet of wire rope, machine tools, etc., and bids are called Sept. 22 for furnishing a large tonnage of conductor line, connectors, etc.

Construction and Enterprise

Ohio

CHAUNCEY, O.—Village, N. D. Hines, mayor, plans construction of sanitary sewer, sewage plant, water works, as WPA project. Plans approved by state department of health, Columbus, O., will probably mature as soon as WPA grant is made. Details undecided. Cost $170,000. J. J. Morgan, 255 East Broad street, Columbus, engineer.

CINCINNATI—Streitman Biscuit Co., Twelfth street and Central Parkway, Cincinnati plans installation of power equipment, including traveling ovens, conveyors, other mechanical equipment, in new two-story baking plant, Mariemont district, near Cincinnati. Entire project to cost nearly $2,000,000. John H. Deekin, 800 Broadway, Cincinnati, is architect. The Streitman company is a subsidiary, United States Biscuit Co. of America Inc., 1041 West Harrison street, Chicago.

CUYAHOGA FALLS, O.—City, Kenneth Ewart, service director, plans construction of sewage plant, sludge conditioning and burning equipment. Includes sludge pumps, air blowers, air filter, lime lift, vacuum filters, sludge incinerator, oil burning and heating equipment, sludge collecting mechanism, air diffusing and metering equipment, ferric chloride feeding and control machinery, miscellaneous piping and appurtenances. Cost of plant, $162,300; sludge conditioning and burning equipment, about $49,000, including all appurtenances. Separate bids due noon, Sept. 15. Certified check or bid bond 5 per cent to accompany bid.

KENT, O. — City, Charles Horning, service director, city hall, plans $60,000 bond issue election, Nov. 7, for water works improvement.

SABINA, O.—Village, Harry G. Burris, clerk, plans vote on $42,000 bond issue Nov. 7, for municipal light, heat, power plant improvements. Includes two additional diesel engines.

New Jersey

BELLEVILLE, N. J.—Heyer Products Co., 740 Washington avenue, manufacturer of battery chargers, testers, other electrical equipment and specialties, plans installation of motors and controls, regulators, conveyors, other equipment in new one-story plant on 2½-acre tract recently acquired. Erection to begin at once. Cost estimated at $150,000.

Pennsylvania

BUTLER, PA.—Contracts for design and construction of a one-story warehouse and garage for T. W. Phillips Gas & Oil Co., Butler, Pa., have been awarded The Austin Co., Cleveland. The structure will be 120 x 205 feet, equipped with monorails, costing approximately $100,000.

PHILADELPHIA—Lit Bros. department store, Eighth and Market streets, Philadelphia, plans installation of motors and controls, conveyors, electric freight elevators, other equipment in new five-story warehouse building totaling 600,000 square feet floor space. Total cost about $2,000,000. Edward P. Simon, Fidelity Philadelphia building, architect.

Michigan

EAST LANSING, MICH. — Michigan State college officials, East Lansing, are preparing specifications for $130,000 addition to college power plant.

Indiana

INDIANAPOLIS, IND.—Perfect Equipment Corp., 522 Union Bank building, Kokomo, Ind., has been incorporated to manufacture steel products and tools, with 1000 shares of no par value stock, by William P. Smissen, J. R. Lucas, C. H. Willis.

Delaware

SEAFORD, DEL.—Seaford Power & Light Co., plans expansion in local generating station, including installation of new generating unit and auxiliary equipment. Estimates of cost being made.

Florida

PENSACOLA, FLA.—Board of port commissioners, J. T. Wright, chairman, is considering a new cold storage and refrigeration plant in connection with fruit terminal and distribution building on waterfront. Cost about $250,000, with equipment.

Tennessee

CLARKSVILLE, TENN.—Montgomery county farm bureau and Cumberland electric membership corp., M. C. Northington, project superintendent, are interested in erection of locker refrigeration plant for Clarksville and Montgomery county, Tenn. Preliminary plans approved; will cost $25,000. To contain 350 lockers for indivdual use, each having sufficient capacity to accommodate 100 pounds of meat. Will organize separate co-operative to operate.

West Virginia

WEIRTON, W. VA.—Weirton Steel Co.,

MR. PROGRESSIVE
MACHINE TOOL BUILDER
If you use
HOLLOW BORED FORGINGS, LATHE SPINDLES, PISTON RODS, HYDRAULIC CYLINDERS, CLUTCH SHAFTS or RAMS
would you be good enough to let us tell you our story? We've been specialists in this line for 21 years, and we are in a position to fill your orders promptly, efficiently and at a satisfactory cost. We are, the
AMERICAN HOLLOW BORING COMPANY
1054 W. 20th ST., ERIE, PA.

P&H

Serving American Industry Since 1884 — Overhead Electric Cranes and Hoists Crawler Cranes • Electric Motors • Arc Welders • Welding Electrodes.

Harnischfeger Corporation

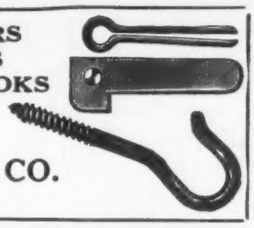
4411 W. National Ave., Milwaukee, Wis.

LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS

OHIO

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS OHIO

SPRING COTTERS
RIVETED KEYS
SCREW EYES, HOOKS
and WIRE SHAPES



HINDLEY MFG. CO.
Valley Falls, R. I.

JAMES CRISWELL COMPANY
Furnace Engineers & Contractors
Open Hearth, Soaking Pits and heating furnaces
Keenan Bldg. Pittsburgh, Pa.

DESIGNING AND COMBUSTION ENGINEERS
SPECIALIZING IN
OPEN HEARTH FURNACES

LOFTUS ENGINEERING Corporation
509 OLIVER BLDG. PITTSBURGH, PA
TELEPHONE ATLANTIC 4480

C. H. HUNT
CONSULTING ENGINEER
Specializing in Consultation on General Steel Mill and Industrial Plants
First National Bank Bldg., Pittsburgh, Pa.
Phone ATlantic 9885

H. A. BRASSERT & COMPANY
Consulting Engineers
for IRON, STEEL, FUEL and HEAVY METALLURGICAL INDUSTRIES . . . . .
310 SOUTH MICHIGAN AVENUE • CHICAGO

Pickling of Iron and Steel—*By Wallace G. Imhoff*
This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.
Price Postpaid $5.15 (25s6d.)
THE PENTON PUBLISHING CO.
Book Department
1213 W. 3rd St. Cleveland, O.
520-S

---

save hours and dollars with FORD TRIBLOCS

● Ford Triblocs are saving countless hours of time for thousands of users. Because they are fast in operation—and because they are "on the job," ready for use, at all times.

Triblocs are also directly saving countless dollars for these users. Because their first cost is low—and they are maintained at a minimum of expense.

The Ford Tribloc is a quality spur-gear hoist. It is made throughout of high grade drop forgings and malleable castings of certified grade. Its ACCO High Carbon Heat Treated chain has great strength and high elastic limit. Each hoist must stand a 50% overload test before shipment.

Write for information on Triblocs in ¼-ton to 40-ton capacities.

BUY ACCO QUALITY *in Ford Triblocs and other Ford Hoists, in Page Welding Electrodes, Page Wire Fence, Tru-Lay Pre-formed Wire Rope, Reading-Pratt & Cady Valves, Campbell Abrasive Cutting Machines, American Welded & Weldless Chains.*

Order from your distributor

TRADE MARK ACCO

FORD CHAIN BLOCK DIVISION
PHILADELPHIA, PENNSYLVANIA
See our exhibit in Metals (Products) Building, Opposite the Perisphere and Trylon, New York World's Fair

AMERICAN CHAIN & CABLE COMPANY, Inc.
In Business for Your Safety

plans installation of motors and controls, conveyors, electric hoists, other equipment in new additions to steel mill, comprising two one-story units, 80 x 900 feet. Construction begins immediately. Total cost estimated in excess of $6,000,000. The company is a subsidiary of National Steel Corp., Pittsburgh.

Minnesota

MOORHEAD, MINN.—Water and light board, Fred Wensel president, as noted previously plans expansion and improvement in municipal electric power plant, including installation of new 3000 kilowatt turbine-generator unit and auxiliary equipment, switchboard, instruments, accessories. To cost about $100,000.

WHEATON, MINN. — Village, M. J. Fridgen, clerk, is making survey for construction of light and power plant. G. M. Orr & Co., 452 Baker Arcade, Minneapolis, consulting engineer.

Texas

DALLAS, TEX.—City, E. A. Baugh, public works director, will authorize bids for final unit of $1,500,000 sewage disposal plant. Tentative contract lately awarded. Project will be let in from four to six parts.

Kansas

STERLING, KANS.—City, Robert F. Peart, manager, will hold special election Sept. 19, on $198,000 bond issue to finance construction of new power plant building and installation of diesel generating sets, switchboard and new feeder lines. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineers.

North Dakota

WHITMAN, N. DAK.—Five star rural electric co-operative has been allotted $40,000 to finance construction of electric generating plant. F. C. Chandler, president. Ellerbe & Co., 1021 East First National Bank building, St. Paul, is consulting engineer.

Nebraska

HASTINGS, NEBR.—Central Nebraska public power and irrigation district, R. O. Canaday, secretary, is taking bids to Sept. 20, 11 a.m. on construction of power transmission lines and furnishing various power substation equipment as per plans obtainable from owner. Certified check 5 per cent to accompany bid.

STANTON, NEBR. — Stanton county rural public power district has filed application with state railway commission for authority to construct 291 miles rural transmission lines in Stanton, Colfax, Madison counties.

Iowa

BROOKLYN, IOWA—City, F. J. Gates, mayor, will hold special bond issue election Sept. 22, to finance construction of municipal light plant to cost $135,000.

CEDAR FALLS, IOWA—City, H. B. Philpot, city clerk, is taking separate bids to Sept. 19, 7:30 p.m. on construction of three sewage disposal plants as per specifications obtainable from clerk. Clark N. Street, 119 West Third street, city engineer. Certified check 10 per cent to accompany bid.

DAVENPORT, IOWA — Eastern Iowa light and power co-operative has awarded contract subject to REA approval to Monroe Electric Co., Chicago, at $219,864 for construction of 318 miles rural transmission lines in Scott, Muscatine, Louisa, Johnson, Cedar, Clinton counties.

PELLA, IOWA—REA has allotted $59,000 to the Pella electric co-operative, John Hoeksema, superintendent, to finance construction of 55 miles rural transmission lines in four counties.

ST. CHARLES, IOWA—City, J. M. Torrence, city clerk, will hold special bond issue election Sept. 14 to vote on $14,000 bond issue to finance construction of waterworks plant.

Colorado

BAILEY, COLO.—Intermountain rural electric association, J. B. Fitzsimmons, president, has awarded contract to Collier Electric & Radio Co., 52 Broadway, Denver, at $86,633 for construction of 99 miles rural transmission lines in Park, Jefferson, Clear Creek counties. Glenn R. Fickel, 518 Temple Court building, Denver, consulting engineer.

Pacific Coast

NYSSA, OREG.—Bids have been called Sept. 18 for construction of sewage treatment plant.

ROSEBURG, OREG.—Gatewood Lumber & Plywood Co. has been incorporated at $1,000,000; plans construction of $800,000 sawmill and plywood factory at Myrtle Creek. Company has purchased one billion feet of sugar pine and fir timber.

GOLDENDALE, WASH.—City has retained Engineer L. R. Stockman, Bend, Oreg., to prepare plans for proposed disposal plant and water system extension.

KENT, WASH. — Fire recently destroyed plant of Washington Frosted Foods Inc.; damage $100,000.

NEWPORT, WASH.—Pend Oreille electric co-operative has been organized by Gerald Mott and associates.

SEATTLE—Golden Reef Mining Co., capital $100,000, has been incorporated by Albert Lauch and associates, 41 Dravus street, Seattle.

SEATTLE — Gjarde Construction Co., Seattle, is low at $69,989 for substructure of all-steel warehouse for Columbia Steel Co., to be built on eight acre tract at Third avenue south and Lander street. Project involves two bays, each 70 x 415 feet, to be equipped with depressed tracks, trucking facilities, overhead electric cranes, other machinery.

SPOKANE—K. M. Robinson, president Washington Water Power Co., announces rural power line extensions throughout this area to cost $1,000,000 during the coming three years, involving 2000 miles transmission line.

SPOKANE—Inland REA is obtaining right of way and plans bid call soon for construction of 577 miles of transmission lines in Whitman, Garfield, Spokane counties. Association has federal loan of $535,000.

SPOKANE—Inland empire rural electric association, Glen H. Bell, superintendent, will receive bids Sept. 15, for units six and seven, involving respectively 151 miles power line in Garfield county, 160 miles near Pullman, Wash., estimated cost $300,000.

SPOKANE—City water department, Alex. Lindsay, superintendent, plans purchase of electrically operated pumping machinery and accessory equipment, including air compressor, control cable, electric controls and other equipment needed for expansion and improvement of water system. Total budget of $960,000 being arranged.

TACOMA, WASH.—Sound Gold Co., 4138 South Park avenue, has been incorporated at $100,000 by E. H. Levee and associates.

TACOMA, WASH. — Indianeen Mines Inc., 3011 South Fife street, capital $100,000 has been organized by M. E. Sanford and associates.

WALLA WALLA, WASH.—Oronoco Mercury Mines Inc., capital $100,000 has been formed by R. E. Combs and associates, 201 West Main street.

Alaska

CORDOVA, ALASKA—Roberts Lumber Co. has been incorporated at $100,000, plans to install modern plant.

Include Historic Philadelphia in Your Itinerary

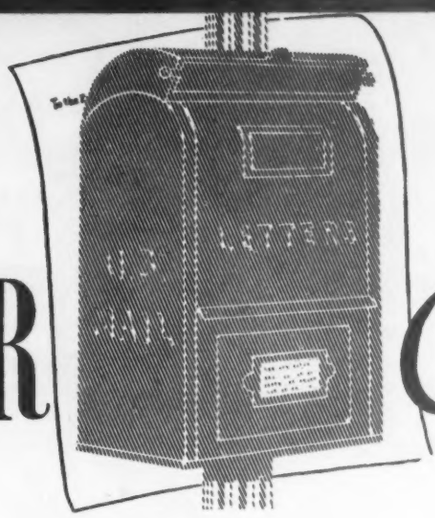
PHILADELPHIA social, commercial and amusement life centers around this famous hotel geographically and traditionally. Its food is world-renowned, its service is perfect—and rates are reasonable.

(Air-Conditioned Restaurants)

BELLEVUE-STRATFORD

CLAUDE H. BENNETT, *General Manager*

READER Comments



Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Finds Steel Rate Accurate

To the Editor:

Your editorial in STEEL, Sept. 11, on the value of the rate of steel production as a barometer of general business is well conceived, in our opinion, as we have been using this for several years as a guide.

Probably no other figure is based on wider contact with all forms of business, both as a buyer and a supplier, unless it may be carloadings of railroads. We have found the figures presented in your columns from week to week the greatest help in determining our policies, not only as related to business in the entire industry but as to the several districts on which you give reports.

One factor in its usefulness is its frequency, once a week, affording action more promptly than in the case of the monthly or quarterly announcements. More power to STEEL and may your accuracy never grow less. We value it highly.

STEEL SUPPLIER

Cleveland

More Eye Protection Needed

To the Editor:

The following may represent interesting material for a news report. A statistical report recently issued by the industrial commission of Wisconsin reveals that eye injury cases settled in 1938 under the Wisconsin's workmen's compensation act totaled 725 and cost $426,376, such costs representing 9.07 per cent of total benefits paid for all injuries.

Another significant figure taken from the report shows that the average benefits per eye injury totaled $588 whereas the average benefits for all injuries totaled only $230.

This statistical report is highly important for the reason that Wisconsin is the only state giving such a detailed report on eye injuries.

Assuming that Wisconsin's experience with industrial eye injuries is typical of all states, it is evident that eyes in industry are not receiving the protection they should. To reduce compensation costs and at the same time remove needless pain and suffering, every industrial concern should not only institute an eye safety program but should strictly enforce it.

Summed up. the Wisconsin industrial commission's report showed the following:

	All injuries	Eye injuries
Total cases settled	20,383	725
Working days lost	1,975,891	138,354
Average days lost per injury	97	190
Per cent of total days lost	100	3.56
Total indemnity	$3,516,612	$371,241
Medical aid	$1,178,769	$ 55,135
Total benefits	$4,695,381	$426,376
Per cent of total benefits	100	9.07
Average benefits per injury	$230	$588

RAY GENTZLER

American Optical Co.,
Southbridge, Mass.

Public Income Without Tax

To the Editor:

On reading your editorial in STEEL, July 17, I am moved to say that nothing can be done to relieve business until it is recognized that land speculation is a stifling deterrent to progress and business. When that day arrives taxation will be discontinued because publicly created income will be collected by the public and privately created income will be left in the hands of those that create it.

JOSEPH S. THOMPSON

President,
Pacific Electric Mfg. Corp.
San Francisco

Good News of Railroads

To the Editor:

It is encouraging to read the statement of J. J. Pelley, president of the Association of American Railroads (STEEL, Sept. 11, p. 26) that there need be no fear the carriers will be unable to handle practically any amount of traffic that may be offered, war or no war.

The margin of 25 per cent more than at present, with existing equipment, is rather a surprise, in view of the talk recently heard of the plight of the railroads and their need for much additional rolling stock. That a further increase to 45 per cent would result from moderate car and locomotive repairs is additional comfort.

The interesting thing about the statement is that present efficiency has come about largely since 1920, after the close of the World war. Mr. Pelley sets this at 100 per cent and his statement is that the traffic of 1929, the largest in history, could be carried in 350,000 to 400,000 less cars than were available at that time.

Evidently the railroads have been progressing during the hard times they have encountered and have made hay while there was no sunshine. These gains in ability to handle more freight with less equipment are in line with advances in other lines of industry, and indicate railroading has been held at a high point of efficiency in the face of adverse conditions.

Mr. Pelley is in a position to know whereof he speaks and his assurance is sufficient to remove one cause of worry, should business increase to a point where greater transportation demands will be made.

MANUFACTURER

Chicago

THE DIESEL CRANE IS OUT IN FRONT

All over America today, Industrial Brownhoist Diesel cranes are replacing steam machines. The reasons why this is so should be of interest to everyone who handles materials.

With good grades of fuel oil available at low cost in most localities, the Industrial Brownhoist Diesel can effect a saving of at least 25% over existing handling costs. Furthermore, the Diesel crane is easier to operate and its two-speed travel and sustained power are a revelation to anyone whose work includes car switching. Last, but not least, the Industrial Brownhoist Diesel will have done an hour's work or more each morning while the steam crane is taking on coal and water and getting "steamed up".

Would it surprise you if an Industrial Brownhoist Diesel could pay for itself in two to three years on your work? We are confident that it would. May we help you compile the comparative figures?

INDUSTRIAL BROWNHOIST

GENERAL OFFICES: BAY CITY, MICHIGAN

DISTRICT OFFICES

New York Philadelphia Pittsburgh Cleveland Chicago

DIESEL AND GASOLINE CRANES, 10 TO 50 TONS CAPACITY
STEAM LOCOMOTIVE CRANES, 10 TO 200 TONS CAPACITY
CRAWLER CRANES, 10 TO 35 TONS CAPACITY
BUCKETS, ½ TO 15 YARDS CAPACITY